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STUDIES IN THE AGARICS OF DENMARK

PART XII.

HEBELOMA, NAUCORIA, TUBARIA, GALERA, BOLBITIUS, PLUTEOLUS, CREPIDOTUS, PSEUDOPAXILLUS, PAXILLUS

ADDITIONAL DESCRIPTIONS
AND SUPPLEMENTARY NOTES TO PART I—XI

BY

JAKOB E. LANGE

KØBENHAVN
H. HAGERUPS BOGHANDEL
BIANCO LUNOS BOGTRYKKERI A/S
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Studies in the Agarics of Denmark.

Part XII.

Hebeloma, Naucoria, Tubaria, Galera, Bolbitius, Pluteolus, Crepidotus, Pseudopaxillus, Paxillus.

Additional descriptions and supplementary notes to part I—XI

by

Jakob E. Lange.

THE GENUS HEBELOMA

The genus Hebeloma is a very natural one, the species of which are very intimately related. In fact the real difficulty confronting the mycologist is not the delimitation of the genus, but of the individual species which often run completely into each other. The majority of the *Hebelomas* are of medium stature, but the genus also comprises a number of very small species, as well as some very large ones. The former may be mistaken for *Naucorias*, but can be distinguished, macroscopically, by their more fleshy stem and pallid, whitish colours; the latter may have a somewhat Cortinarioid exterior. Some affinity also exists between *Hebeloma* and certain *Pholiotas*, particularly *P. radicosa* and *P. erebia*.

Microscopical characteristics. While the microscope is of paramount importance for the identification of the *Inocybes*, it is not nearly so useful in the case of the *Hebelomas*. — The form of the spores only varies within a comparatively narrow limit — from ellipsoid-ovate to obliquely limoniform — neither is their size very variable (the average length rarely falls below 8 or exceeds 12 μ). It is not unlikely that careful investigation by means of strong lenses will show characteristic variations in the configuration

of the spores of all the species; but when observed by moderate power — as is the case here — they simply seem to be either glabrous or warty-punctate. The gill-edge is always set with sterile cells. These cystidia, however, are never very conspicuous. They are generally obtuse, often somewhat club-shaped, straight or slightly wavy, hair-like bodies. In some cases they exude drops of water, visible to the naked eye or under a pocket-lens. But this characteristic depends too much on the state of the weather to be of outstanding importance for the identification.

Taxonomy. Fries divided the genus in three sections: the velate, the naked and the pygmean group. But the latter hardly deserves to be upheld. Even in the Friesian sense it is a very small group; and by removing *Ag. petiginosus* to *Inocybe* — where it undoubtedly belongs — and cancelling *A. sterilis* — which probably is a *Cortinarius* (*C. pulchellus* Lange) — it is reduced to next to nothing. I therefore divide the genus in two main sections only: *Indusiata* and *Denudata.* It is true that the veil in some of the indusiate species is very fugacious and rudimentary; but by careful examination of the unopened cap it is nevertheless fairly visible, at least by means of a pocket-lens. — The minor groups are even more difficult to characterise. The Key will show how I have tried to overcome the difficulties.

The number of species here described is rather limited. Some of the Hebelomas are very polymorphous and have been split up into a number of minor species, but their characters appear to me to be too vague, depending too much on age and weather, to give them any claim to specific rank.

KEY

TO THE SPECIES FIGURED IN "DANMARKS AGARICACEER".

A. **Indusiata.**

Veil present, minutely fibrillose or somewhat shaggy-woolly.

α Rather large and stout (Stem about 1 cm. broad) .. 1. *H. fastibile.*

β Medium or small species.
- 1. Stem woolly-fibrillose up to the spurious ring .... 2. *H. strophosum.*
- 2. Stem merely fibrillose; no ring.
  - a. Cap paler or darker date-brown on the disc; towards the pallid edge more or less fibrillose or shaggy .. 3. *H. mesophæum.*
  - b. Not so.
    - * Medium. Cap tall; base of stem obtuse ...... 4. *H. testaceum.*
    - ** Very small (Cap 1—2$^1/_2$ cm.). Stem slightly rooting 5. *H. pumilum.*

B. **Denudata.**

No trace of a veil.

α Ingrata. Smell of radish (or faint).
- 1. Cap fulvous. Rather stout species .... 6. *H. truncatum.*
- 2. Cap some other colour (alutaceous, café au lait or dull brown).
  - a. No long, tapering tap-root.
    - * Very large. Cap 5—12 cm., alutaceous tan or pale café au lait .... 7. *H. sinapizans.*
    - ** Medium to small.
      - † Medium (Cap 3—6 cm.).
        - o Stem rather short (almost = diam. of cap) 8. *H. crustuliniforme.*
        - oo Stem tall (twice diameter of cap or more).
          - § Cap alutaceous. Stem almost white .. 9. *H. longicaudum.*
          - §§ Cap and stem pale ochre. Stem very slender 10. *H. elatum*(?).
      - †† Very small (Cap 1—2$^1/_2$ cm.) .... 11. *H. pusillum.*
  - b. Stem elongated into a very long, tapering tap-root 12. *H. spoliatum.*

β Sacchariolentia. Smell strong, sweetish-aromatic 13. *H. sacchariolens.*

SYSTEMATIC AND FLORISTIC NOTES.

A. INDUSIATA

1. **Hebeloma fastibile** Fr.

Large to rather large. Cap 4—6 cm, convex, alutaceous to pallid clay-colour, viscid, rather thick-fleshed. Gills pallid, then slightly flesh-coloured, becoming clay cinnamon. Veil evident, membranous-fibrillose. Stem rather stout, about 1 cm thick, of the same colour as the cap (inside and outside), fibrilloso-striate, slightly pruinose at apex. — Subfasciculate.

Spores ovate, $8—9^1/_2 \times 5—5^3/_4$ μ ($7—10 \times 4—6^1/_2$ μ), smooth, almost hyaline. Cystidia obtuse, hair-shaped, total length about 60 μ, base slightly inflated (5 μ).

Fig. specimens: ("*Danmarks Agaricaceer*", plate 454)*): Gregarious, under Picea in dense plantation, Nov. 1901. — Also found at Gelsted, open space in wood of Picea and Pinus. Rather rare.

I have never observed any drops on the gill-edge in this species. Konrad & Maublanc also have it from coniferous woods, while Fries gives "silvis campestribus" as its habitat.

2. **H. strophosum** Fr.

Medium. Cap 3—4 cm, convex to sub-umbonate, almost smooth (sub lente minutely innato-squamulose), viscid, but soon dry, brownish clay. Gills broad, emarginate, pallid, becoming tinged with pale flesh-colour and finally clay-brownish. Stem slender (5—6 cm × 5—6 mm), peronate up to the fibrillose spurious ring by a dense woolly-fibrillose coating, white above, dingy ochry clay-brown below. Flesh concolorous. Smell slight, of radish. Taste somewhat bitter.

Spores ellipsoid oval, $7^1/_2—9 \times 4^1/_2—4^3/_4$ μ, smooth, very pale, almost hyaline. Cystidia clavate hair-shaped, obtuse, rather short (40 μ), base slightly inflated (5 μ).

*) The numbers refer to the water-colour portraits "*Danmarks Agaricaceer*", a collection which now numbers about 1150 species or distinct varieties painted by the author 1893—1937. The collection is in the Botanical Museum, Copenhagen. All the species are figured in "*Flora Agaricina Danica*" Vol. III.

Fig. spec.: (D. A. suppl. after pl. 454). Kalundborg, "Møllebakken", in grass among young Picea, gregarious, Oct. 1922.

The typical *H. strophosum* is rare, transitional forms to *H. mesophæum* are more frequently met with.

3. **H. mesophæum** Fr.

Medium to rather small. Cap $2^1/_2$—$4^1/_2$ cm, convex, subumbonate when expanding, clay-brown, disc often almost date-brown, edge pallid whitish, fibrillose when in bud, somewhat viscid. Gills pallid, becoming flushed with pallid flesh-colour, dingy brown with age. Stem medium or short, whitish at first, but soon tinged with dirty brown from base up (darker earth-brown inside), more or less fibrillose, with a distinct, fibrillose veil.

Spores ovate, $9^1/_2$—10×5—$5^1/_2\,\mu$, contents minutely granular. Cystidia short, obtuse, about $40\,\mu$ long, $6\,\mu$ broad.

Fig. spec.: (D. A. pl. 455). Under Picea alba in a hedge around a shrubbery, Nov. 1906. Very common, till late in the season, often in great numbers, chiefly in open plantations, but also on naked soil amongst shrubs etc.

As here conceived *H. mesophæum* is a rather polymorphous species, varying in stature and colour. A more strongly umbonate form, with a dark dirt-brown or almost bistre umbo, which is occasionally met with in more sunny places, almost equals *H. holophæum* Fr.

4. **H. testaceum** (Batsch).

Medium. Cap $2^1/_2$—5 cm, convex-flat or slightly umbonate, not fibrillose towards the edge; disc fulvous tan, edge whitish. Gills whitish, becoming flushed with flesh-colour and then light brownish, beaded with minute drops. Stem rather tall, slowly changing from whitish to a very pale dingy brownish (from base up), glabrous, with minute fibrils of an apical veil. Flesh pale brownish flesh-colour. Taste somewhat bitter.

Spores obliquely ellipsoid, $10^1/_2$—11×5—$6\,\mu$, glabrous or indistinctly punctate. Cystidia obtuse, base inflated, 45—50×3—$4\,\mu$ (base about $7\,\mu$).

Fig. spec.: (D. A. pl. 456). "Tøjstrup" near Ringe, about a stump of Alnus, in Fraxinus-Betula swamp. Sept. 1909. — Not uncommon, often gregarious.

The purer and lighter colours, the almost glabrous stem and the very fugacious veil distinguish this species from *H. mesophæum.*

5. **H. pumilum** Lange n. sp.

Small. Cap 1—$2^1/_2$ cm, convex (at first almost semiglobate-campanulate), pale clay-brownish (edge whitish, disc tan-brownish), smooth, viscous. Gills broad, broadly emarginate, eroded, edge (sub l.) minutely fimbriate and somewhat beaded with drops,

becoming watery light cinnamon (edge whitish). Stem 3—4 cm × 2—4 mm, cylindric, base often protracted into a short "tap-root", whitish, minutely pruinate above the fugacious, fibrillose veil; below the veil minutely fibrillose. Smell almost none. Taste slightly bitter.

Spores obliquely ovate to sub-limoniform $8^1/_2$—$9 \times 5^1/_2\,\mu$, minutely punctate. Cystidia short, 25×4—$5\,\mu$, sub-clavate. Basidia 4-spored.

Fig. spec.: (D. A. pl. 457): Rudme, on naked soil under old Fagus, gregarious. Sept. 1912. — Also met with in several other similar localities under Fagus.

A very characteristic pygmean species.

B. DENUDATA

a. Ingrata.

6. **H. truncatum** (Schaeff.) Fr.

Large and stout. Cap 4—$6^1/_2$ cm., campanulate convex, fleshy and firm, bright fulvous to rufo-fulvous, viscid, edge turned slightly upward. Gills broadest behind, somewhat adnate, whitish, then pale cinnamon, not beaded with drops. Stem cylindrical, stout and short, whitish, slightly fibrilloso-striolate and somewhat powdered. Smell obsolete. Flesh white, tasting somewhat rank-bitterish. Spore-powder light ochry cinnamon.

Spores ellipsoid, smooth, $8^1/_2$—$10 \times 4^1/_2\,\mu$, light yellow. Cystidia hair-shaped clavate, apex about $5\,\mu$.

Fig. spec.: (D. A. pl. 463): Tommerup, gregarious in grass among young Picea. Not uncommon in similar localities.

Some modern authors regard *Ag. truncatus* Schaeff. as a *Rhodopaxillus* or *Tricholoma*. But the Friesian species has ferruginascent gills and must be a genuine *Hebeloma.*

7. **H. sinapizans** (Paul.).

Very large. Cap 5—12 cm, convex or slightly gibbous, alutaceous tan, with a flush of flesh-colour. No trace of a veil at the minutely pruinate edge. Gills pallid at first, not visibly beaded. Stem solid, 5—8 cm × 13—15 mm, often rather tall, incrassated below (and occasionally also above), base more or less rooting, upper part coarsely white-squamulose (about half way down), whitish, becoming flushed with pallid clay-brownish from base up. Smell faint; taste bitter.

Spores obliquely ovate ellipsoid, sub-limoniform, 10—$11^1/_2 \times 5^1/_2$—$6\,\mu$. Cystidia rather short, cylindric clavate, 5—$6^1/_2\,\mu$ above.

Fig. spec.: (D. A. pl. 458): Pederstrup, on moist ground in dense plantation of Picea, Nov. 1900. — Often growing in circles or arcs. Not uncommon in similar places, rarer in frondose woods.

H. sinuosum Fr., especially as depicted by Konrad & Maublanc (loc. cit. tab. 80), seems to me identical. And my specimens lack

the strong radish-smell said to characterise *H. sinapizans*. But according to Fries *H. sinuosum* belongs to *Indusiata* (although the veil is nowhere mentioned), and I have therefore made use of the Pauletian name.

8. **H. crustuliniforme** (Bull.).

Medium to rather large. Cap 4—6 cm, convex or somewhat gibbous, alutaceous pallid, more or less tinged dirt-brownish or dingy tan. Gills pallid, densely beaded with drops. Stem solid, 4—5 cm × 5—13 mm, often sub-bulbous, whitish, flocculoso-granulose from apex downward, sometimes even to the base. Smell of radish.

Spores ovate ellipsoid, slightly limoniform, $11^1/_2$—$12 \times 6^1/_2\,\mu$, indistinctly punctate. Cystidia clavate-cylindrical, apex 5—7 μ broad.

Fig. spec.: (D. A. pl. 459): Hjallese, moist ground in frondose wood, Oct. 1898. Very common in moist woods, among debris in gardens etc.

A very variable species, varying in colour (from almost white to dirty tan), size, stoutness and scalyness.

9. **H. longicaudum** (Pers.).

Medium to rather large. Cap 3—$5^1/_2$ cm, campanulate-convex, alutaceous white, umbo slightly darker, viscid. Gills whitish, becoming flushed with flesh-colour and then café au lait, very minutely beaded with drops or almost dry. Stem slender (7—8 cm × 7 mm), apex slightly farinose, base indistinctly bulbose, whitish, somewhat hollow. Taste bitterish; smell almost none.

Spores sub-limoniform, 10—$12 \times 6^1/_2\,\mu$, minutely punctate. The cuticle is mainly made up of thin (2—4 μ broad) fibrils. Cystidia clavate hair-shaped.

Fig. spec.: (D. A. pl. 461): "Højsholt" near Tommerup, gregarious in moist wood of Fagus, Oct. 1915.

The almost naked, slender stem and almost inodorous flesh distinguish this species from whitish forms of *H. crustuliniforme*. Cooke's figure ("*Illustrations*" pl. 415) is uncommonly large.

10. **H. elatum** (Batsch) var. (?).

Medium, very tall. Cap about $4^1/_2$ cm, plano-convex, rather fleshy, viscid, alutaceous ochre, edge minutely reticulate-lacunose. Gills crowded, narrow (about 3 cm), somewhat café au lait. Stem very tall and slender (12 cm × 3—5 mm), fistulose, minutely fibrillose, pale tan, whitish at apex and base, glabrous (apex slightly pruinose). Taste somewhat bitter. Smell slightly rank (not of radish). Spore-powder light cigar-brown.

Spores almost lemon-shaped, somewhat compressed, $8 \times 5^1/_2 \times 4\,\mu$, transparent, light dingy ochre. No marginal cystidia; on the gill-faces a very few vesiculose ones, about 18 μ broad.

Fig. spec.: (D. A. suppl. after pl. 461): Glamsbjerg, solitary in grass, outskirts of wood (Picea etc.), Sept. 1926.

This peculiar species is more like a giant *Naucoria semiorbicularis.* — On boggy ground in "Gerup Skov", Holstenshus, I have met with a very similar type, but with the ordinary marginal cystidia. Cooke's figure (*Illustrations* pl. 962) is a more robust plant, with broader gills.

11. **H. pusillum** Lange n. sp.

Very small. Cap 0,8—2 cm, conic-convex, then expanded, with a small but rather prominent umbo of date-brown rufous colour, the rest of the cap pallid tan (edge whitish), slightly viscid. Veil absent. Gills rather broad, beaded with drops at the edge, rather distant, pallid, then flesh-colour clay-brown. Stem 2—4 cm × 1—$2^1/_2$ mm, white, powdered, not hollow. Flesh slightly bitter; smell faint, of radish.

Spores ellipsoid lemon-shaped, generally about 12—13 × 6 μ (10—$14^1/_2$ × $5^1/_2$—7 μ). Cystidia clavate, 45—60 × 6—11 μ. Cuticle formed of rather coarse, 4—12 μ broad, sausage-shaped cells.

Fig. spec.: (D. A. pl. 460): "Langesø", on boggy ground (bottom of drained pool) under Salix cinerea, Oct. 1907. Not uncommon in similar places.

This tiny little species is the smallest within the genus. *H. hiemale* Bres. is somewhat larger, indistinctly umbonate, and forms a transition to the smaller forms of *H. crustuliniforme.*

12. **H. spoliatum** Fr.

Medium, tall, rooting. Cap 2—5 cm, somewhat campanulate, then convex or slightly umbonate, clay-brown, becoming darker, almost date-brown at the disc (edge pallid), viscous. Gills whitish, then clay-brownish cinnamon. Stem slender, 5—6 cm × 4—6 mm, with a long, tapering root, narrowly fistulose, whitish at first, flushed (inside and outside) with the colour of the cap when growing old.

Spores oval ellipsoid, $8^1/_2$—10 × 5 μ, brownish yellow. Cystidia hair-shaped.

Fig. spec.: (D. A. pl. 462): Hesbjærg, growing gregariously in a wood of Fagus (with some Picea-trees), Oct. 1901. — Rare.

Fries' figures ("*Icones sel.*", tab. 113) are very good, but do not show the characteristic "tap-root" which, however, is mentioned in the text.

β. Sacchariolentia.

13. **H. sacchariolens** Quél.

Medium or rather small. Cap $2^1/_2$—4 cm, convex or slightly gibbous, alutaceous, more or less flushed with pale clay-brownish. Gills broad, pale flesh-colour to dingy cinnamon. Stem 4—5 cm ×

4—6 mm, whitish, flushed with clay-brown from base up, fibrillose. Smell strong, sweetish-aromatic.

Spores ovate limoniform, 11—12 × 6 μ (or 10½—12 × 6½—7 μ), minutely punctate. Cystidia obtuse, hair-shaped, about 6 μ broad. The fibrils of the cuticle are rather thin (about 3 μ broad).

Fig. spec.: (D. A. pl. 464): Hjallese, moist frondose wood, Oct. 1901. Not uncommon in similar localities.

H. Quéletii Schulz evidently is synonymous. The peculiar sweetish odour (reminding of burnt sugar, cinnamon and *Inocybe Bongardii*) distinguishes this species from all the rest.

THE GENUS NAUCORIA

The genus Naucoria as conceived by FRIES is very far from being a homogeneous group: Dark- and light-spored species, indusiate and naked ones, xylophilous and terrestrial Agarics are grouped together in a rather unsatisfactory way. And their microscopical diversity — as revealed by post-Friesian investigations — is also considerable. — The genus comprises a multitude of species with a cuticle of fibrillose texture, but also numerous forms with a cellular, parenchymatic epiderm. Spores and cystidia likewise show great variation in many ways.

To me *Naucoria* is simply a kind of Austrian empire in the mycological world. But I leave it at that, provisionally, only subdividing the genus into subgenera, the right position of which — outside or inside the genus — is yet to be ascertained.

The most distinguished and well defined of these minor sections which modern mycological authors have established are *Macrocystidia* and *Alnicola* besides the group of dark-spored species which FRIES grouped under *Phæoti*. *Macrocystidia* is perhaps the least Naucorioid of these sections. The somewhat pinkish colour of the spore-print even made earlier authors place some of its forms in *Nolanea*. Miscropically they are all very well characterised by the large, inflated cystidia both on the gill-edge and on the cap, which account for the name *Macrocystidia*. — *Alnicola* has a cellular-parenchymatic epiderm and large, somewhat rough spores. These traits it shares with another small group of species, with different cystidia, which I call *Salicicola*. The two together make up my new sub-genus *Cytocutis*. — *Phæonaucoria* (the section *Phæoti* of FRIES) is easily recognised by the cigar-brown colour of the spore-print.

The boundary-line between *Naucoria* and *Tubaria*—*Galera* (on either side) is not very distinct. It is very likely that *Tubaria* had

better be disbanded, removing its rusty-spored species to *Galera* and *Naucoria* and transferring *T. inquilina* to the neighbourhood of *Psilocybe* (*Deconica*) *physaloides*.

A number of the larger species of *Eu-Naucoria* are either Flammuloid or Collybioid in habit, and are grouped accordingly. *Vestitæ* is a rather heterogeneous group. *Naucoria erinacea* is even by some authors removed to *Pholiota*.

Microscopical characteristics. The spores vary considerably in size, shape and configuration. In the majority of species they are almost glabrous (when examined without an immersion-lens); but some are distinctly rough or granulate. Their colour varies from dark amber to almost hyaline, their size from about 16 μ length down to 6 μ. They are comparatively uniform in shape; I know of no globate, stellate or fusiform spores within the genus. In most cases they are ovate, sub-limoniform or sub-phaseoliform. The cystidia are generally almost filiform, but varying either somewhat clavate or inflated at the base. Broader, more bottle-shaped cystidia are found in *Phæonaucoria*, exceptionally provided with peculiar finger-like appendages; and in *Macrocystidia* we have the conical-vesiculose large cystidia mentioned above. The cellular epiderm in a number of species is made up of almost isodiametric cells of varying size. And the cuticle of *Naucoria* (*Macrocystidia*) *cucumis* is, according to KÜHNER (loc. cit.) formed of rather coarse, sub-parallel, cylindrical fibres, between which innumerable cystidia stick out. In the really fibrillose cuticle of the majority of the species the fibrils are rather thin and somewhat interwoven. — Two-spored basidia are rare.

Taxonomy. The details of the systematic arrangement here propounded will be seen in the Key and will require no further comments than those given in the notes above.

KEY

TO THE SPECIES FIGURED.

1. *Eu-Naucoria.*

Spores sub-ferruginous. Texture of cuticle fibrillose.

A. Nudæ. Cap not squamulose or granulate.

a. Collybiaræ. Stem with a long, tapering root.

1. Cap fulvous tile-red, cuspidate .... 1. *N. Christinæ.*
2. Cap brown, rather obtuse .... 2. *N. Jennyæ.*

β. Flammuloideæ. Stem without "tap-root".
- 1. Spores rough, rather large (about 10 μ long). Cap obtuse ... 3. *N. cerodes.*
- 2. Spores smooth, smaller.
  - a. Gills light-coloured (ochry, ferruginous).
    - * Cap convex-flat ... 4. *N. abstrusa.*.
    - ** Cap umbonate, sub-campanulate.
      - † Cap 2—4 cm, somewhat fulvous.
        - o Veil rudimentary ... 5. *N. sideroides.*
        - oo Veil white-fibrillose ... 5a. *N. sideroides* var. *indusiata.*
      - †† Cap bay-brown, 1—1½ cm ... 6. *N. triscopa.*
  - b. Gills and cap pallid olivaceous.
    - * Stem and cap minutely velutinous atomate ... 7. *N. centunculus.*
    - ** Cap glabrous, pellucido-striate ... 8. *N. reducta.*

B. Vestitæ. Cap squamulose or granulate-pruinate.
- α. Cap with acute, erect squamules. Spores large (11 × 8 μ) ... 9. *N. erinacea.*
- β. Not so.
  - 1. Cap with minute, adpressed squamules or woolly-flocculose.
    - a. Cap fibrillose-squamulose ... 10. *N. pityrodes.*
    - b. Cap woolly-flocculose ... 11. *N. siparia.*
  - 2. Cap granulate-mealy or pruinate.
    - a. Species growing on the ground ... 12. *N. granulosa.*
    - b. Species growing on beech-mast, twigs or dead foliage.
      - * Tall-stemmed species on beech-mast and -leaves ... 13. *N. carpophila.*
      - ** Short-stemmed species on twigs, etc. ... 14. *N. effugiens.*

II. *Cytocutis.*

Spores large, rough. Cuticle formed either of roundish cells or of coarse fibres made up of vesiculose, barrel-shaped or almost cylindrical cells.

A. Alnicolæ. Cystidia Urtica hair-like. Cuticle fibrous. Species generally attached to Alnus.
- α. Veil evident, fibrillose, on edge and stem ... 15. *N. conspersa.*
- β. Veil obsolete.
  - 1. Young fruit-body chestnut-brown.
    - a. Cap 1—2.5 cm ... 16. *N. scolecina.*
    - b. Cap 0.8—1.2 cm ... 16a. *N. scolecina* forma *gracillima.*
  - 2. Young fruit-body alutaceous or pale ochry tan, becoming darker and dusky brown with age ... 17. *N. escharoides.*

B. Salicicolæ. Growing in Salix-bogs etc. Cystidia obtuse, cylindric-clavate. Cuticle cellular.
- α. Stem slender, white when young ... 18. *N. scorpioides.*
- β. Stem fuscescent, shorter.
  - 1. ... 19. *N. macrospora.*
  - 2. ... 19a. *N. macrospora* var. *tetraspora.*

III. *Phæonaucoria.*

Spore-print cigar-brown.

A. Pediades. Spores medium (8—13 μ long). Cystidia somewhat bottle-shaped.

- α. Cap rather broad (up to 4 cm). Stem short. Spores about 9 μ
  20. *N. vervacti.*
- β. Cap smaller. Stem more slender.
  - 1. Cap semiglobate to convex. Spores 12—13 μ long
    21. *N. semiorbicularis.*
  - 2. Cap convex flat. Spores about 10 μ.
    - a. Stem rooting, but not springing from a sclerotium
      22. *N. arvalis.*
    - b. Stem springing from a black sclerotium
      22a. *N. arvalis* var. *tuberigena.*

B. Myosotides. Spores very large (about 15 × 8 μ). Cystidia obtuse, almost cylindrical.

- α. Cap about 3 cm. Whole plant olivaceous-fuscous ..... 23. *N. myosotis.*
- β. Cap about 2 cm. Whole plant pale clay or wood-brownish
  23a. *N. myosotis* forma *minor.*

IV. *Macrocystidia.*

Cuticle, stem and edge of gills set with large, acute, inflated-conical Cystidia. Spore-print and gills somewhat salmon-coloured (or almost white).

A. Cap 2—5 cm, umber or bistre, edge pale, even .... 24. *N. cucumis.*

Cap 1—1½ cm, paler brown, edge striate.

- α. Gills very broad, triangular. Spore-print very pale salmon
  24a. *N. cucumis* var. *latifolia.*
- β. Gills rather narrow. Spore-print almost white
  24b. *N. cucumis* var. *leucospora.*

SYSTEMATIC AND FLORISTIC NOTES.

1. EU-NAUCORIA

A. Nudæ.

a. Collybiaræ.

1. **Naucoria Christinæ** Fr.

Rather large and tall. Cap 2—3 cm, conic-convex with a prominent, mucronate umbo, bright tile-red, expallent, somewhat viscid. Gills almost free, alutaceous, becoming ochry ferruginous. Stem rather tall, cylindrical, with a several cm long "tap-root", pallid reddish when young, becoming fulvous from base up.

Spores obliquely ovate-ellipsoid, $8^1/_2$—$9 \times 4^1/_2\,\mu$, light yellow. Edge of gills set with about $5\,\mu$ broad, nodulose hairs. Basidia 4-spored, about $7\,\mu$ broad.

Fig. spec.: (D. A. pl. 474): "Frijsenborg", in wood of Abies and Picea, growing gregarious on the ground amongst needles. Rare.

N. Christinæ is a very conspicuous plant, not likely to be overlooked; and it is therefore remarkable that neither Rea nor Ricken have ever seen it. It is, however, not an exclusively Northern species, as Bresadola has it from Tyrol.

2. **N. Jennyæ** Karst.

Medium to rather small. Cap 1—$2^1/_2$ cm, conic-convex, obtusely umbonate, bay-brown (subfulvous and shining when dry). Gills broad, but almost free, light ferruginous brown. Stem thin and straight, about $2^1/_2$—4 cm $\times 1^1/_4$ mm, concolorous with the cap, provided with a long, thin tap-root, which penetrates the needle-bed and reaches down in the soil underneath. Spore-print ferruginous.

Spores ovate or somewhat pip-shaped, $5^1/_2$—$6^1/_2 \times 3^1/_2$—$4\,\mu$. Cystidia hair-shaped clavate, obtuse, about $5\,\mu$ broad above, $2^1/_2\,\mu$ at the base. Basidia 4-spored.

Fig. spec.: (D. A. pl. 475): Høbbet, near Faaborg, wood of Picea, in the deep needle-bed, Oct. 1900. Rather rare, mostly to be found in old Picea-woods, exceptionally met with once under Betula (probably in a former Picea-wood).

A very distinct species. Karsten describes it with a blood-red stem, while in my specimens it is more rufous-bay. But as the

spore-dimensions are almost identical I deem it not unwarranted to use the Karstenian name.

β. Flammuloideæ.

3. **N. cerodes** Fr.

Rather large to below medium. Cap $1^1/_4$—3 cm, convex, rufous, becoming rather deep ochry yellow, from centre out, in dry weather. Gills almost plane and plano-adnate, pale yellowish, then rusty. Stem about 3 cm × 1—$2^1/_2$ mm, becoming rufo-fulvous from base up.

Spores ovate ellipsoid, sub-limoniform, 9—$11^1/_2 \times 5$—$6^1/_2\,\mu$, yellow, punctate-rough or warty. Cystidia hair-shaped.

Fig. spec.: (D. A. pl. 483): Skørping, on peaty ground, open space in a scanty vegetation of Erica tetralix etc., gregarious, Sept. 1897. Not uncommon in similar localities.

Easily recognised by means of the large spores.

4. **N. abstrusa** Fr.

Rather large to medium. Cap 2—$3^1/_2$ cm, convex-flat, glabrous, viscid, brownish yellow, subfulvous in the middle, expallent (when young paler, when old darker clay-brownish, fulvous in wet weather). Veil rudimentary. Gills rather crowded, at first pallid yellowish, then rusty cinnamon, plane or slightly descendent, adnate or sub-decurrent. Stem rather short ($2^1/_2$—4 cm), about 3 mm thick (slightly broader above), pale yellowish, becoming dirty yellow-brown (raw sienna) from base up. Flesh in cap rather thick, light yellow (whitish when dry), in stem yellow to brownish yellow, without smell and taste.

Spores ellipsoid phaseoliform, $5^3/_4$—$6^1/_2 \times 3^1/_4$—$3^3/_4\,\mu$, very light yellow. Cystidia cylindric, hair-shaped or sub-clavate, sometimes sub-capitate, always obtuse, protruding portion about $20\,\mu$ long, total length about $40\,\mu$.

Fig. spec.: (D. A. suppl. after pl. 483): Næsbyhoved, on the ground amongst grass in rather low meadow-land behind a Prunus spinosa-hedge, Oct. 1936 (and 37).

This rare species has a rather Flammuloid habit.

5. **N. sideroides** (Bull.)

Medium to rather large. Cap 2—$3^1/_2$ cm, campanulate with a rather acute umbo, expanding, with a viscid, detachable pellicle, edge minutely striate, hygrophanous, fulvous to gilvous (ochre when dry). Veil rudimentary (some few white fibrils from stem to edge of bud). Gills adnate, slightly emarginate, with a decurrent denticle, pallid ochre, then ochry ferruginous. Stem rather slender (5—7 cm × 2—4 mm), paler than the cap (pallid above, becoming brownish ferruginous from base up, thinly clad with white, silky fibrils, slightly pruinate above.

Spores narrowly ovate, $8 \times 4^1/_4\,\mu$, pale yellow. Cystidia hair-shaped, slightly capitate, somewhat thickened towards the base ($6\,\mu$ broad).

Fig. spec.: (D. A. pl. 486): Kirkeby, wood of Picea, gregarious on the needle-bed, Oct. 1914. Not uncommon in similar places.

This species is very well characterised by the viscid pellicle. It has many traits in common with *Pholiota unicolor* and *P. marginata*, but lacks the ring.

5a. **N. sideroides** var. *indusiata* Lange n. var.

Differs from the main type by having a very evident veil, consisting of silver-white fibrils between the stem and the edge of the cap (occasionally also on the lower half of the bud). The fibrils may even form a rudimentary, fibrillose ring, and they cover the stem almost completely.

Spores $6—7 \times 4—4^1/_4\,\mu$ (slightly smaller than in the main form).

Fig. spec.: (D. A., supplement after pl. 486): Ørbæklunde, on needles and fallen twigs in wood of Fagus and Picea, Oct. 1936. — Also met with in Jylland.

Agaricus anguineus Fr. as depicted by Fries (*Icones sel.* tab.122[1]) is very much like *N. sideroides* in habit and characters, but twice as large. And the description does not mention any viscosity.

6. **N. triscopa** Fr.

Small. Cap $1—1^1/_4$ cm, conic-convex with a rather prominent umbo, hygrophanous, bay-brown and minutely striate when wet, alutaceous ochre when dry. Gills brownish ferruginous, broad and broadly adnate (or with a sub-decurrent denticle). Stem thin, ascendent, about $3\text{ cm} \times 1$ mm, concolorous. Veil absent. Spore-print light ferruginous.

Spores ovate ellipsoid, $7 \times 4\,\mu$. Cystidia hair-shaped, in tufts on the gill-edge. Basidia 4-spored.

Fig. spec.: (D. A. pl. 488): Hjallese, in the head of an old pollarded Salix viridis, on the decaying wood, subfasciculate, Nov. 1905.

Kühner ("*Le genre Galera*") describes under the name *Galera triscopoda* an entirely different species (velate; young cap and stem densely hairy (sub lente)). It grows on coniferous stumps.

7. **N. centunculus** Fr.

Medium to rather small. Cap 0.8—2.5 cm, convex, subumbonate, brownish olive, expallent, atomate, edge incurved. Veil none. Gills very broad, rotundate, dingy olive with a fimbriate, whitish edge, thick. Stem rather short (about 2 cm), almost concolorous, pruinate velutinous, base white-velutinous. Spore-powder cinnamon ochre.

Spores ovate or slightly phaseoliform, $6^1/_2—7^1/_2 \times 4\,\mu$. Cystidia

hair-shaped, obtuse, sub-capitate, 5—6 μ broad. The pruinosity of the cap is due to dispersed, about 20 μ long, cylindrical hairs.

Fig. spec.: (D. A. pl. 479): Hjallese, on a fallen trunk of Populus, gregarious on the decaying wood, Oct. 1901. Also met with on Fagus.

8. **N. reducta** Fr.

Rather small. Cap 1—1.8 cm, slightly convex to sub-depressed, indistinctly umbonate, submembranaceous, brownish olive (edge paler, amber-yellowish), minutely striate about half way in. Gills pallid, then watery gray-brownish, rather crowded, somewhat adnate, ventricose. Stem 3—4 cm × 2 mm, hollow, dingy amber-yellowish, dusky olive towards the base. Veil absent.

Spores narrow ellipsoid, $8^1/_2$—$9 \times 4^1/_2$ μ, light brownish yellow. Cystidia clavate, hair-shaped, about 30×5 μ. Basidia 4-spored.

Fig. spec.: (D. A. suppl. after pl. 495): Husmandsskolen, Odense, in grass on green walk in copse (Alnus, Quercus etc.) on moist ground, Aug. 1923.

Fries places this species in "*Scorpioideæ*", but the spore-print is not cigar-brown. I have not had the opportunity to ascertain whether the epiderm is fibrillose or cellular, and the position of this little species is therefore somewhat uncertain.

B. Vestitæ.

9. **N. erinacea** Fr.

Rather small. Cap 1—$1^1/_2$ cm, convex flat, ochry ferruginous, everywhere clad with erect, pointed squamules of agglutinated fibrils which on the edge form a brim originally connecting the stem and the cap. Gills rather broad, rounded-adnate, pallid at first. Stem rather short (2 cm), often curved, hairy squamulose, sub-concolorous.

Spores limoniform-ovate, 11×8 μ, smooth, pale yellow. Cystidia short, hair-shaped, about 4 μ broad. Basidia with two long sterigmata, 30×7 μ

Fig. spec.: (D. A. pl. 496): Hjallese, growing on the bark of dead Rosa canina branches, June 1911. Rather rare. Also met with on sticks of Salix cinerea.

Some authors refer this little very characteristic species to *Pholiota*, which may be right, although the stem has no distinct ring.

10. **N. pityrodes** (Brig.).

Small. Cap 0.7—2.3 cm, convex flat, with a more or less evident, small umbo. Fundamental colour pale straw-yellow, but more or less completely covered (especially in the middle) by minute, adpressed, fibrillose squamules of a rusty or subfulvous colour. When these squamules disappear with age the cap becomes honey-yellow, its edge adorned with an about $^1/_3$ mm broad, fimbriate, whitish veil. Gills rather narrow and moderately crowded, emarginate, pale

yellowish, later becoming brownish ochre (when growing soaked in water almost orange-yellow). Stem $1^3/_4$—3 cm × 1—$1^3/_4$ mm, pallid yellowish above, ferruginascent towards the base, supported by a whorl of about 5 radiating, stiff, somewhat dichotomous, mycelioid hairs. Spore-print cinnamon ochry.

Spores almost bacilliform or somewhat phaseoliform, $5^3/_4$—$6^3/_4$ × $2^1/_2$ μ, sub-hyaline. Cystidia on edge hair-shaped clavate, 30—35 × 4—5 μ, on face of gills (rather scanty) ovate clavate, about 9 μ broad.

Fig. spec.: (D. A. suppl. after pl. 496): Elsehoved, on decaying stubble and stems of Phragmites in wet or submerged places in Salix cinerea bogs, rather numerous, but always solitary, Oct. 1934 (and 1935).

This tiny species which was described from Italy about a hundred years ago is probably not rare, but easily overlooked. I have not seen it mentioned in any European flora.

11. **N. siparia** Fr.

Very small. Cap about 1 cm, convex, ferruginous bay, at last somewhat striate, minutely floccoso-lanuginose, edge fibrillose. Gills plano-adnate, not crowded, paler than the cap, edge minutely fimbriate. Stem about 2 cm × 1 mm, glabrous above, lanuginose like the cap below the veil-mark, concolorous.

Spores ovate ellipsoid, 8 × $4^1/_2$ (or $7^1/_4$ × $4^1/_4$ μ). Cystidia flexuose hair-shaped, apex more or less inflated into a roundish head of 6—7 (11) μ diameter. Hairs on surface of cap formed of 6—18 μ broad, rugulose cells, with brownish contents.

Fig. spec.: (D. A. pl. 497): Våsemose, Holmstrup, on sandy or loamy soil amongst Polytricha, on sloping ground in open space of wood (of Fagus), Oct. 1912. Also found in Jylland.

I have never seen this species growing on dead fern-fronds, said to be its most common habitat.

12. **N. granulosa** Lange n. sp.

Very small. Cap 0.5—1.2 cm, obtusely campanulate to convex, cinnamon, without striation, clad with a mealy coating which in the middle forms granular squamules. Gills very broad, rotundate-adnate, paler than the cap, edge fimbriate. Stem $1^1/_2$—$2^1/_2$ cm × 1—$1^1/_2$ mm, lanuginoso-flocculose up to the imprint of the marginal veil, which is woolly hairy; apex of stem pallid, flushed with the colour of the cap below.

Spores narrowly and somewhat obliquely ellipsoid, $9^1/_2$—10 × 4 μ. Cystidia hair-shaped (about 5 μ broad below, 3 μ above) flexuose. Coating of cap formed of subglobose or oval, about 30 μ long cells with pale brownish contents.

Fig. spec.: (D. A. pl. 498): Hunderup Skov, on naked humus

under Acer pseudoplatanus, in wood of Fagus, in small troops, Oct. 1903.

Evidently this species is related to *N. siparia*, but it is easily distinguished by the paler colour and the granular-mealy coating.

13. **N. carpophila** Fr.

Very small. Cap 0.3—0.7 cm, convex, furfurate granulate, edge fimbriate from the veil, very pale ochry tan (the smallest specimens often alutaceous). Gills generally rotundate, broad, concolorous. Stem rather slender (2—3 cm × 0.7—1 mm) furfurate, of the same colour.

Spores ovate, somewhat pip-shaped, $7^1/_2$—8×5—$5^1/_4\,\mu$. Cystidia subulate hair-shaped, protruding portion about $35\,\mu$.

Fig. spec.: (D. A. pl. 501): Hjallese, on dead leaves of Fagus, June 1897, and on Beech-mast, July 1898. — Not common.

Some authors transfer this species to *Tubaria*, in the vicinity of *T. furfuracea*.

14. **N. effugiens** Quél.

Very small. Cap about 0.6 cm, almost flat, indistinctly umbonate, pale gray with a flush of brownish olive, edge minutely striate, surface thinly covered by coarse meal. Gills broadest behind, ventricose, rather distant, almost free, grayish with a tinge of brown. Stem short, curved, about 0.5 cm × 0.6 mm, slightly powdered, paler than the cap.

Spores broadly ovate, 8—$8^1/_2 \times 5^1/_2$—$5^3/_4\,\mu$. Cystidia hair-shaped, slightly nodulose, apex sub-capitate, $3^1/_2\,\mu$ broad (head $5\,\mu$), free portion about $25\,\mu$ long. Basidia 2-spored.

Fig. spec.: (D. A. pl. 480): Hjallese, on a small twig of Quercus, in a moist copse, Nov. 1898.

This tiny species has much in common with *Crepidotus haustellaris* Fr.; but the stem is central.

II. CYTOCUTIS.

A. Alnicolæ.

15. **N. conspersa** (Pers.).

Medium. Cap $1^1/_4$—2 cm, somewhat campanulate, expanding, umber-cinnamon or somewhat rufous, hygrophanous (alutaceous when dry), minutely furfuraceous squamulose, when young with a fugacious, appendiculate veil. Gills cinnamon, broadest behind, emarginate. Stem 3—4 cm × $2^1/_2$—3 mm, pallid above, tinged dark bistre-brown from base up, minutely flocculose-fibrillose (flocci yellowish white).

Spores obliquely ovate-ellipsoid, 10—13×5—$6\,\mu$, punctate. Cystidia almost Urtica hair-like, with a long or rather short hair

and a swollen base (protruding portion about 30 μ long, base 6—10 μ broad).

Fig. spec.: (D. A. pl. 499): Hjallese, on peaty ground on and about roots of Alnus in a bog, Sept. 1906. Rather rare.

The habit of this species is very much like that of the following one; but it is easily recognised by the distinct veil and the somewhat squamulose cap.

16. **N. scolecina** Fr.

Medium. Cap $1^1/_2$—2 cm, campanulate convex, rufous bay-brown, hygrophanous, glabrous, indistinctly striate at the margin. Gills broad, at first pale, then somewhat ferruginous, broadest behind, emarginate. Stem 3—4 cm × 2—$2^1/_2$ mm, colour of cap, paler above, slightly fibrillose below, hollow.

Spores ellipsoid, somewhat acuminate, 11—14 × $5^1/_2$—6 μ. Cystidia Urtica hair-like, base swollen, ovate, about 8—10 μ broad, total length 55—60 μ. Cuticle made up of coarse, brownish fibrils, formed of cylindrical, barrel-shaped or subovate, 10—25 μ broad and 30—60 μ long cells.

Fig. spec.: (D. A. pl. 484): Vormark, on the ground in Alnus-copse, among the creeping tree-roots, Oct. 1898. Not uncommon, always under Alnus.

16a. **N. scolecina** forma *gracillima.*

Differing from the main form by its reduced size. Cap 0.7—1.2 cm, Stem about 3 cm × 1 mm. Gills almost plano-adnate.

Spores ellipsoid fusiform, 13—14 × $6^1/_2$ μ, minutely punctate, yellow. Cystidia as above.

Fig. spec.: (D. A. pl. 485): Killerup, peaty ground in Alnus-copse, Oct. 1914.

The plano-adnate gills give it a somewhat Tubarioid habit.

17. **N. escharoides** Fr.

Medium. Cap $1^1/_4$—$2^1/_2$ cm, convex expanded, thin-fleshed, at first alutaceous or very pale ochry, becoming dingy cinnamon with age, in wet weather; edge somewhat fimbriate. Gills rather narrow, concolorous. Stem whitish alutaceous, gradually turning almost bistre-brown from base up. Veil not very evident, fibrillose, evanescent.

Spores ovate, $10^1/_2$—$11^1/_2$ × $5^1/_2$—$6^1/_2$ μ. Cystidia Urtica hair-like, base strongly inflated (up to 10 μ broad). Cuticle of cap made up of coarses fibres formed of cylindrical to subovate, 10—25 μ broad cells.

Fig. spec.: (D. A. pl. 500): Hjallese, Alnus-copse, Oct. 1895, in great numbers. Very common, always attached to Alnus.

B. Salicicolæ.

18. **N. scorpioides** Fr.

Medium. Cap $1^1/_2$—3 cm, campanulate convex, then expanding and broadly umbonate, subviscid when wet; pale dingy cinnamon with a flush of dull rufous, especially on the umbo, almost without striation. Gills rather distant, pale clay-cinnamon (edge paler), narrow and narrowly adnate. Stem rather slender (3—6 cm × 2—3 mm), somewhat flexuose, apex white-flocculose pruinose, for the rest densely clad with a white, fibrillose coating (inside turning rufous brown from base up). Spore-powder clay-cinnamon (almost as in *Hebeloma*). Veil rudimentary, obsolete.

Spores almost lemon-shaped, $11^1/_2$—13 × $7^1/_4$—8 μ, warty granulate, brownish yellow. Cystidia cylindrical (or slightly narrower midway), about 45 × 6 μ. Basidia 2-spored. Cuticle of cap parenchymatic, made up of isodiametric cells.

Fig. spec.: (D. A. pl. 495): Aaløkkeskov, Odense, in a swamp amongst Betula and divers shrubs, Oct. 1919. Not uncommon, growing in moist places in woods and copses, generally solitary or few together.

My plant answers so well to the Friesian description of *N. scorpioides*, that I have no hesitation in applying this name to it. *Naucoria bohemica* Vel. forma *bispora* seems to be identical (vide Maire & Kühner in *Bull. Soc. Myc. Fr.* vol. 51 p. 197).

19. **N. macrospora** Lange n. sp.

Medium to rather small. Cap 1—2 cm, at first somewhat campanulate, expanded-umbonate, dry, almost without striation, dull and dingy rufous, paler towards the edge, expallent, except at the umbo. Gills somewhat distant, rather broad, adnate thick, dull brownish with a blunt whitish edge. Stem 3—4 cm × 2 mm, paler than the cap, apex slightly powdered, sparingly white-fibrillose. Veil absent or reduced to some few, evanescent fibrils between the stem and the budding cap.

Spores elongated limoniform, 13—20 × $7^1/_2$—9 μ. Cystidia clavate, often somewhat inflated (5—14 μ broad). Basidia with two sterigmata. Cuticle of cap made up of almost isodiametric, parenchymatic cells (diam. 15—40 μ).

Fig. spec.: (D. A. pl. 481): Gerup Skov (Holstenshus) in a drained pool, on the decaying leaf-humus under Salix cinerea, gregarious, Sept. 1904. Not uncommon, apparently always attached to Salix cinerea.

19a. **N. macrospora** forma *tetraspora*.

Differing from the main form by being slightly larger ($1^1/_2$—3 cm), less distinctly umbonate, colour somewhat darker, more date-brown. The smell is faint, neither raphanoid nor sacchariolent, but the flesh has a distinctly bitter after-taste. No veil.

Spores limoniform, 12—15 × $6^1/_2$—$7^1/_2$ μ, coarsely warty-rugulose. Cystidia and cuticle as in the main form. Basidia 4-spored.

Fig. spec.: (D. A. pl. 482): Sanderum, in a Salix cinerea bog, gregarious, Oct. 1914. — Rarer than the 2-spored form.

Modern mycological litterature abounds with descriptions of species of the *Salicicolæ*-tribe. *N. amarescens* Quél. differs, according to Rea (loc. cit. p. 353) in ochraceous, then tawny gills and somewhat smaller spores; *C. lenticeps* Peck in fuscous ochry colour. *N. glandiformis* Cooke is larger and taller. *N. submelinoides* (Kühner) Maire is very close but has a farinaceous smell, thinner gills and a very different habit. I have studied these *Salicicolæ*-forms for the last 30 years. They differ from *N. scorpioides* by their comparatively short, coloured, almost naked stem and longer spores (*N. scorpioides* is not exclusively Salicicolous).

III. PHÆONAUCORIA.

A. Pediades.

20. **N. vervacti** Fr.

Rather large. Cap 2—4 cm, convex, ochraceous, slightly brownish in the middle, rather fleshy. Gills very broad, broadly adnate, at first pallid, becoming almost bay-brown. Stem short (2—3 cm), comparatively stout ($2^1/_2$—5 mm), white.

Spores ovate, 8—$9^1/_2$ × 5—$5^1/_2$ μ. Cystidia of different shape, varying from bottle-shaped conical to almost Urtica hair-like, total length 30—40 μ.

Fig. spec.: (D. A. pl. 489): Kerteminde, edge of road, in grass, gregarious, Sept. 1899. Rather rare.

In stature and colour it recalls *Stropharia coronilla.*

21. **N. semiorbicularis** (Bull.).

Medium to rather small. Cap $1^1/_2$—2 cm, semiglobate to convex, smooth, varying in colour from alutaceous to pale tan. Gills very broad, pallid when young, becoming nebulose brownish and at last dark cinnamon. Stem thin (3—4 cm × 1—$2^1/_2$ mm, base slightly swollen) pallid, with a flush of the same colour as the cap, somewhat powdery.

Spores ovate to sub-limoniform, mostly 11—13 × $7^1/_2$—8 μ ($10^1/_2$—14 μ). Cystidia bottle-shaped, body about 10—12 μ broad, neck short. No fingered cystidia on the face of the gills.

Fig. spec.: (D. A. pl. 490): Hjallese, on border of road, gregarious, July 1897. Common, on old lawns, at roadsides etc.

A substerile form is occasionally met with; its gills remain light ochre. To my mind no real difference exists between *N. semiorbicularis* and *N. pediades* Fr. Rea, however, describes the latter with smaller spores (8—9 × 5—6 μ) like *N. vervacti.*

22. **N. arvalis** Fr.

Medium to rather small. Cap $1^1/_2$—2 cm, convex, becoming flat or even somewhat depressed with age, pale tan. Gills narrower than in the preceding species, slightly adnate. Stem slender (4—7 cm × 2—3 mm), everywhere pulverulent-downy, paler than the cap, with a longer or shorter mycelioid "root".

Spores oval-ellipsoid, 10×5—$5^1/_2$ μ. Cystidia on gill-edge obtusely bottle-shaped or almost cylindrical, 7—9 μ broad. (Facial cystidia not investigated).

Fig. spec.: (D. A. pl. 491): Vormark, in grass-field, Oct. 1898. Not common, in stubble-fields and amongst grass.

22a. **N. arvalis** var. *tuberigena* Quél.

Medium, somewhat larger than the main form, springing from a roundish, black sclerotium (about 1 cm diam.).

Spores oval, 9—$9^1/_2 \times 5^1/_2$—6 μ. Cystidia on edge of gills subulate-bottle-shaped, about 60×12 μ. Cystidia on face of gills decanter-like, with 3—6 finger-shaped, upright excrescenses (body about 14 μ, neck about 4 μ, head 9 μ, fingers 10—18×3 μ). In many cases the number of facial cystidia is very reduced.

Fig. spec.: (D. A. pl. 492): Rudme, straw-covered space in outskirts of wood, Sept. 1916. — Also met with in stubble-fields.

It remains to be seen whether any real difference exists between the sclerotium-bearing form and the ordinary type. The mycelioid "root" in the latter may indicate, that it springs from a sclerotium. Velenowsky describes this variety sub nom. *Naucoria sclerotigena.* It has also been described from Norway, by J. Egeland.

B. Myosotides.

23. **N. myosotis** Fr.

Large (or rather large) and tall. Cap 2—3 cm, convex, brownish olive, viscid and shining, edge somewhat striate, with evanescent fibrils. Gills very broad, rotundato-adnate, rather distant, pallid dingy olive brownish, edge whitish. Stem tall and slender, straight, concolorous with the cap (pale above), 8—11 cm × 2—4 mm.

Spores ellipsoid-ovate, $14^1/_2$—$15^1/_2 \times 8^1/_2$ μ. Cystidia hair-shaped cylindrical or slightly bottle-shaped, obtuse, about 7 μ thick.

Fig. spec.: (D. A. pl. 493): Borris (Skernå-dalen), in meadow-land amongst grass and Juncus conglomeratus, Sept. 1921. Not uncommon, in peaty bogs and Betula-swamps, generally solitary.

23a. **N. myosotis** forma *minor.*

Smaller than the type (cap $1^1/_4$ cm, stem 7 cm × $1^1/_2$ mm). Cap pale dingy horn-brownish, stem flushed with the same colour.

Spores $17 \times 8^1/_2$—9 μ. Cystidia as in the main form.

Fig. spec.: (D. A. pl. 494): Gandløse Ore, on peaty ground under Betula and Picea, Sept. 1914.

Fries ("*Icones sel.*" tab. 125) depicts a specimen of this form among the larger and more olivaceous ones which I regard as the type.

IV. MACROCYSTIDIA.

24. **N. cucumis** (Pers.).

Large to small. Cap 1—6 cm (mostly 2—3 cm), somewhat campanulate or conic-convex, expanding, in full vigour rufous bistre (edge pallid), alutaceous or pale tan when dry, minutely pruinate. Gills rather narrow, ventricose, whitish when young, then ochry salmon. Stem generally rather slender, concolorous with the cap (pale above), slightly attenuated downward, pruinate velutinous. Smell strong, of cucumber or herring. Spore-print salmon-ochry.

Spores ellipsoid, $8 \times 3^1/_2$—$4\,\mu$). Cystidia vesiculose-conical, acuminate, about 60×12—$16\,\mu$. Similar cystidia on stem and cap.

Fig. spec.: (D. A. pl. 476): Hjallese, wood of Picea, Oct. 1896. Common, in various localities: open spaces in woods, among chips and rubbish, even in coniferous plantations.

24a. **N. cucumis** var. *latifolia* Lange n. var.

Small. Cap 1—$1^1/_4$ cm, strongly convex, with an evanescent, minute papilla, coarsely striate almost to centre, fulvous rufous, shading off into pale ochry, alutaceous towards the edge. Gills very broad, but almost free, edge fimbriate. Stem about 3 cm $\times$ $1^1/_2$ mm, pale above, brown below, slightly broader above and minutely pruinate at apex. Spore-print very pale ochraceous-white or alutaceous. Smell fainter than in the main form.

Spores oval oblong, $8^1/_2$—$10 \times 4\,\mu$, almost hyaline. Cystidia 60×14—$20\,\mu$.

Fig. spec.: (D. A. pl. 477): Tommerup, wood of Fagus, Sept. 1905. Rarer than the type; met with as well in frondose woods as on road-borders etc.

24b. **N. cucumis** var. *leucospora* Lange n. var.

Small. Cap 1—$1^1/_2$ cm, convex with a minute, evanescent papilla, bay-brown at the disc, subfulvous towards the edge, coarsely striate half way in. Gills moderately broad, attenuated behind with a decurrent tooth. Stem bistre or bay below, pallid above. Spore-print whitish, with a faint tinge of alutaceous. For the rest like the main species.

Fig. spec.: (D. A. pl. 478): "Fruens Bøge", amongst moss in plantation of Picea, Sept. 1905.

The extreme variability of *N. cucumis* has caused some confusion. The somewhat flesh-coloured spore-print accounts for such

names as *Nolanea pisciodora* (Ces.), *Nolanea nigripes* (Trog.) etc. The almost white-spored forms may be mistaken for *Collybias*. *C. mimica* W. G. Sm. I am inclined to think is such a one. But while variable in habit the species is very constant in microscopical characters, and I therefore refrain from splitting it up in distinct species, although some of the varieties are so divergent that they would be very difficult for the field-mycologist to place, if it were not for the characteristic smell.

THE GENUS TUBARIA.

In a future, more rational taxonomy the genus Tubaria is likely to disappear altogether. The species do not form a natural whole. The genus evidently was created by SMITH to form a parallel to *Omphalia* among the white-spored Agarics. But very few of the species are really Omphalioid. Like most modern authors I uphold the genus provisionally, in the Friesian delimitation, i. e. comprising a light-spored series and a dark-spored smaller group.

Microscopical characteristics. The spores are subovate, smooth and pellucid. The gill-edge is always set with cystidia, but generally very commonplace ones: hair-shaped or somewhat clavate.

KEY

TO THE SPECIES FIGURED.

A. Genuinæ. Spore-powder ferruginous or ochry.

α. Stem more or less coloured. Cystidia hair-shaped clavate. Spores about $8 \times 4^1/_2\,\mu$.

1. Steem gilvous ochre.

* Cap 1—3 cm .... 1. *T. furfuracea.*

** Cap 0.6—1 cm. Gills very distant .... 2. *T. pallidispora.*

2. Stem rufo-ferruginous .... 3. *T. pellucida.*

β. Stem white. Cystidia vesiculose. Spores about $6 \times 3^1/_2\,\mu$ 4. *T. autochthona.*

B. Phæotæ. Spore-powder cigar-brown.

α. Cap with fugacious, white flocci .... 5. *T. crobula.*

β. Cap naked .... 6. *T. inquilina.*

SYSTEMATIC AND FLORISTIC NOTES.

A. GENUINÆ.

1. **T. furfuracea** (Pers.).

Large or medium. Cap 1—3 cm, convex, becoming flat or somewhat depressed, gilvous tan, in wet weather darker and pellucido-striate, in dry weather paler, more or less furfuraceous or silky-squamulose, especially at the edge. Gills adnato-decurrent, concolorous. Stem rather short, 3—4 cm × 2—4 mm, of the same colour, more or less evidently velate or even sub-annulate.

Spores ovate or oval, 7—$8^1/_2 \times 5\ \mu$. Cystidia hair-shaped clavate, apex 4—6 μ.

Fig. spec.: (D. A. pl. 502): Hjallese, border of green walk in frondose wood, Oct. 1903. — Very common almost all the year round, on the ground and among chips, on fallen sticks etc., especially in open spaces in frondose woods.

T. furfuracea is a very variable species according to season and weather. Konrad & Maublanc use the name *T. pellucida* (Bull.) for it, citing *T. furfuracea* as a synonym. I deem it better to reserve the name *T. pellucida* for another species.

2. **T. pallidispora** Lange n. sp.

Very small. Cap 0.6—1 cm, convex, alutaceous pale with pellucid, light gilvous, coarse striæ; when dry paler, without striation, slightly mealy. Gills concolorous, very distant, triangular, with a decurrent denticle. Stem slender, 2—$3^1/_2$ cm × 0.6—0.9 mm somewhat flexuose, of the same colour, glabrous. Veil absent. Spore-powder pale ochre.

Spores sub-limoniform (base acuminate), $9^1/_2$—$10 \times 5^1/_2\ \mu$, almost hyaline. Cystidia hair-shaped clavate. Basidia 4-spored.

Fig. spec.: (D. A. pl. 503): Hjallese, on chips around stump of Fagus, Oct. 1902 and on moist ground among grass in wood of Fagus, July 1905.

This tiny little species is close to *T. furfuracea* (especially the variety *trigonophylla*). The spores, however, distinguish it from pygmean forms of *T. furfuracea*.

3. **T. pellucida** (Bull.).

Small. Cap 0.6—1.4 cm, somewhat campanulate, expanding, in most cases with a small, obtuse papilla, dark ferruginous, coarsely striate half way in, pallid ochry when dry. Gills light ferruginous, very broad, triangular with a decurrent denticle. Stem 2—$2^1/_2$ cm × 0.5—1.2 mm, flexuose, ferruginous. Veil absent or rudimentary.

Spores ovate-ellipsoid, $6^1/_2$—$8 \times 3^3/_4$—$4\,\mu$ (or $8 \times 4^1/_2$—$5\,\mu$). Cystidia clavate hair-shaped, generally obtuse, apex 4—8 μ broad. Basidia 4-spored.

Fig. spec.: (D. A. pl. 504): 1) Hjallese, on a footpath in frondose wood, Oct. 1895. 2) Holmstrup on a ditch-bank, on naked soil, Oct. 1901. Rather rare, but met with under very different conditions.

4. **T. autochthona** Berk. & Br.

Small. Cap 0.8—1.3 cm, convex, alutaceous-pale, not hygrophanous and without striation. Gills light yellow honey-colour, moderately broad with a decurrent tooth. Stem slender, 2—4 cm × 1 mm, white, minutely fibrilloso-floccose. Veil fibrillose, fugacious.

Spores ovate ellipsoid, 5—$6^1/_2 \times 3$—$3^1/_2\,\mu$. Cystidia of various shape, somewhat inflated, mostly obovate-clavate, 8—10 μ broad above.

Fig. spec.: (D. A. pl. 506): Revninge, on naked soil under a hedge (Cratægus), Sept. 1899. — Not uncommon, gregarious, in shady places, probably always attached to Cratægus.

My finds differ from the original description by having an almost equal stem.

B. PHÆOTÆ.

5. **T. crobula** Fr.

Small. Cap 0.8—1.2 cm, convex, slightly umbonate, with a detachable viscid pellicle, dingy alutaceous or pale-brownish, edge slightly striate, with fugucious, white flocci, margin at first appendiculate with the white, dentate veil. Gills broad and broadly adnate, pallid at first, then almost bistre. Stem short, about $1^1/_2$ cm, floccoso-fibrillose up to the veil-mark, almost concolorous with the cap. Spore-print dusky umber.

Spores ovate, $5^1/_2$—$7^1/_2 \times 4$—$4^1/_2\,\mu$ (or $6 \times 3^3/_4\,\mu$). Cystidia Urtica hair-like or almost subulate, 35—40 μ long.

Fig. spec.: (D. A. pl. 508): Trolleborg-Skovene, on dead branches of Rubus fruticosus, Oct. 1898. — Rather rare, on dead branches, saw-dust, rotten sacking etc.

6. **T. inquilina** Fr.

Small. Cap 0.8—1.4 cm, convex, somewhat umbonate, dingy alutaceous, becoming dusky brownish, distinctly striate, very hygrophanous, naked pellicle viscid, detachable. Veil fugacious. Gills

pallid, then bistre or dark cigar-brown, plano-adnate, broad. Stem about 2 cm × 1 mm, concolorous with the cap, at first white-fibrillose. Spore-powder dark cigar-brown.

Spores ovate or sub-limoniform, $8—10^1/_2 \times 4^3/_4—5^3/_4\,\mu$. Cystidia hair-shaped, somewhat inflated below, about $35\,\mu$ long. Basidia 4-spored.

Fig. spec.: (D. A. pl. 507): "Fruens Bøge", on dead blades of grass (Festuca), Nov. 1898. — Not uncommon, especially on rotten grass, mostly solitary.

Very close to the preceding species, chiefly distinguished by the somewhat larger spores and the almost naked cap.

Besides the species here described, the very characteristic *T. embola* is on record from Jylland (Poul Larsen). It is easily recognised by the very distant, thick gills, and the yellow stem. *T. paludosa* I refer to *Galera.*

THE GENUS GALERA.

Galera is a fairly large genus of a rather uniform stamp. The species are small or very small (cap rarely exceeding 3 cm diam.), of a somewhat Mycenoid character: fragile and rather membranaceous cap and slender stem. The gills and the spore-powder are uniformely ochre-ferruginous.

Microscopical characters. — The spores of all the Galeras are ovate or nearly so. In most cases they are almost glabrous (when observed at moderate power); but in certain cases the immersion lens reveals rugosities and other configurations, which, however, are not taken into account here. In *Conocybe* the apical germ-pore is uncommonly distinct. All the Galeras have cystidia on the gill-edge. These are of considerable interest for the identification of the species and the characterisation of the subgenera. The most remarkable type of cystidium, the "pin-head cystidia" adorning the gill-edge of all *Conocybes*, consists of a small, globose pin-head-like head on a very short, thin neck, springing from an obovate body. In other Galeras we have decanter-like, larger cystidia with a more or less swollen, roundish head, while others again have cystidia of the Urtica-hair type: an almost subulate, long hair, more or less inflated below. A quite unique type of cystidium, the Inocyboid one, is met with in *Galera nana*: bottle-shaped with a hood of crystals at the top. — The most remarkable microscopical distinction is, however, the texture of the cuticle of the cap. In *Conocybe* and *Pholiotina* it is parenchymoid, made up of roundish, isodiametric cells, while in all the other groups it is prosenchymoid, consisting of more or less interwoven fibrils.

Fayod and Earle have split up the genus *Galera* into distinct genera (*Conocybe*, *Pholiotina*, *Galerina* ect.), partly corresponding to the original Friesian sections. But as in the preceding genera I prefer to keep them together within the bonds of the original

genus. Kühner in his recent monograph ("*Le genre Galera*") reduces the number of genera to two: *Conocybe* and *Galerina*. Although Kühner's handling of the problem is in many ways excellent, I cannot follow him altogether in his taxonomic innovations. Thus it appears to me that very little is gained by joining the velate, Pholiotoid Galeras (*G. vestita* etc.) with the Teneroid species in *Conocybe*, still less by transferring the small Pholiotas of the *blattaria*-series to the same group. If any alterations of the Friesian system should be found desirable it would probably be better to transfer the velate Galeras to *Pholiota*, as a series of reduced forms, attached to *Pholiota blattaria* and its allies. This enlarged group might even be amalgamated with the rest of the terrestrial Pholiotas (*P. dura* etc.) into a new genus (characterised by the parenchymatic cuticle).

The boundary-line between *Naucoria* and *Galera* is not everywhere quite distinct, and the line of demarcation is drawn a little differently by the various authors. Thus Kühner transfers a number of the Friesian Naucorias (e. g. *N. sideroides*, *N. badipes*, *N. triscopa*) together with *Pholiota unicolor* and *P. marginata* to *Galera*. It is true that all these have several characteristic traits in common; but most of them are not Galeroid, and they are more likely to find their final position in *Pholiota* as a reduced series, attached to *Pholiota marginata*.

The most prominent section of the genus, *Conocybe* (the species round *G. tenera*) is the most homogeneous group, but at the same time the one with the greatest number of minor variations. Kühner divides its species chiefly according to the character of the coating of the stem, whether it be pruinate (from an abundance of "pin-head cystidia") or minutely hairy (with few pin-head cystidia or almost none). It appears to me that especially the latter character is not altogether reliable. The presence or absence of the exceedingly thin mycelioid hairs is probably partly dependent on atmospheric conditions (dry weather, moist habitat etc.). I prefer to use the number of sterigmata as a mark of distinction, although it must be admitted that even this character is not absolutely constant. — The minor details of the taxonomic arrangement of the group will be seen in the Key.

Pholiotina proper is very well characterised by the appendiculate veil and the parenchymatic cuticle. But to the main group I also attach some few veil-less species with a somewhat similar cuticle.

The Galeras with a fibrous cuticle — species included in the Kühnerian genus *Galerina* — I divide in two sections: the Friesian group *Bryogenæ*, the moss-loving species, and a group of species that grow on the ground, on needles, amongst grass etc. which I call *Humigenæ*. *Bryogenæ* it is practical to divide in two: the Sphagnum-loving species and those that grow on ordinary moss. — *Humigenæ* is a rather heterogeneous section; some of its species show a certain affinity to *Bryogenæ*, some to *Naucoria* or *Tubaria*.

A number of characteristic species which have been known from the time of Fries have not come within my range of observation. The most imposing of all the species, the gigantic *Galera apala*, is not on record from Denmark and of *G. sphærobasis*, the other large species — almost of the stature of *Tricholoma melaleucum* — which I have gathered abundantly in Norway — the Danish record is somewhat dubious. Likewise I have sought in vain, for the last 40 years, the characteristic long-rooted *G. antipus*. Although it has a vide range (extending to U.S.A.) it seems to be rare everywhere.

KEY

TO THE SPECIES FIGURED.

I. **Conocybe.**

Cuticle parenchymatic. Cystidia pin-headed.

A. Basidia normally 4-spored.
- *α* Cap and stem cream-white.
  - 1. Cap parabolic .... 1. *G. lactea.*
  - 2. Cap semiglobate .... 1a. *G. lactea* forma *semiglobata.*
- *β* Cap coloured.
  - 1. Spores rather small, generally $< 10\,\mu$.
    - a. Cap expanding, becoming almost flat or even depressed, subfulvous .... 2. *G. teneroides.*
    - b. Cap semiglobate-campanulate, very small, pallid (vide no 4c and 4d).
  - 2. Spores large, generally $> 11\,\mu$.
    - a. Cap conic-campanulate, coarsely striate to centre, fulvous 3. *G. pubescens.*
    - b. Species not uniting these characters.
      - * Large forms. Cap 2—3 cm broad, generally almost without striation.
        - † Cap honey-coloured. Stem becoming flushed with fulvous from base up .... 4. *G. tenera.*

†† Cap and base of stem dingy brownish; cap fleshy, semiglobate .... 4a. *G. tenera* forma *convexa.*
** Smaller forms. Cap 0.8—1.5 cm broad, indistinctly striate, dingy honey or ochre-brownish.
† Spores $10^1/_2$—13×6—$7\ \mu$.
Very slender form .... 4b. *G. tenera* forma *tenella.*
†† Spores smaller.
o Spores 9—10 μ long ..... 4c. *G. tenera* forma *minor.*
oo Spores $7^1/_2$—$8 \times 3^3/_4$—$4\ \mu$ .. 4d. *G. tenera* f. *microspora.*

B. Basidia 2-spored.
α Cap striate almost to centre by subfulvous striæ ..... 5. *G. ambigua.*
β Cap not or but slightly striate, whitish.
1. Cap subglobate-campanulate, small. Stem white .... 6. *G. siliginea.*
2. Cap conic-campanulate, rather large. Stem becoming dirty brown .... 7. *G. Rickenii.*

II. **Pholiotina.**

Cuticle of roundish cells. Cystidia not pin-headed.

A. Cap velate. Veil white, appendiculate.
α Cap alutaceous or light ochre .... 8. *G. appendiculata.*
β Cap fulvous or brown.
1. Cap bay-brown. Spores $6^1/_2$—$7\ \mu$ long .... 9. *G. brunnea.*
2. Cap fulvous. Spores $8^1/_2$—$9\ \mu$ long .... 10. *G. vestita.*

B. Cap without any veil. Stem white.
α Very small; cap $^1/_2$—1 cm. Stem farinose .... 11. *G. Mairei.*
β Rather large; cap 2—4 cm. Stem striate .... 12. *G. pygmæo-affinis.*

III. **Galerina.**

Cuticle prosenchymatic, fibrillose.

A. Bryogenæ. Species attached to moss.
α Sphagnicolæ. Species growing on Sphagnum.
1. Species with white flocci on upper part of stem .. 13. *G. paludosa.*
2. Species with an almost naked stem .... 14. *G. sphagnorum.*
β. Muscicolæ. Species growing among ordinary mosses.
1. Cap and stem rufo-fulvous, rather large 15. *G. rubiginosa* forma *major.*
2. Not so.
a. Small species (cap about 1 cm broad). Stem fulvescent from base up .... 16. *G. hypnorum.*
(vide also no. 25. *G. vittæformis*, with setulose stem).
b. Somewhat larger species. Stem pale.
* No veil. Cap and stem dingy honey ..... 17. *G. mniophila.*
** Veil fibrillose, fugacious. Cap gilvous ochre 18. *G. mycenopsis.*

B. Humigenæ. Species growing on the ground, amongst grass etc., or on needles and twigs.
α Species growing amongst grass. Stem pallid.
1. Rather small species. Basidia 4-spored.

a. Spores large, about 13 μ long .... 19. *G. clavata.*
b. Spores smaller, 8—9 μ long .... 20. *G. graminea.*
2. Pygmean species. Basidia 2-spored .... 21. *G. subtilis.*
β Species growing on the ground, on needles and twigs, among moss etc. Stem deeper coloured.
1. Minute species. Conical cap with minute, effugient, white, silky fibrils .... 22. *G. Sahleri.*
2. Not so.
a. Gills broadly adnate to sub-decurrent. Cystidia bottle-shaped, crested with crystals .... 23. *G. nana.*
b. Gills narrower. Cystidia subulate, base inflated.
* Stem bistre-brown below, white-fibrillose .... 24. *G. badipes.*
** Stem bay-brown below, everywhere minutely setulose (sub lente) .... 25. *G. vittæformis.*

SYSTEMATIC AND FLORISTIC NOTES.

I. CONOCYBE.

1. **G. lactea** Lange n. n. (*G. lateritia* auct. plur.).
Large. Cap $1^1/_2$—$2^1/_2$ cm broad and high, parabolic, cream-white, very slightly striate at the edge, when wet. Gills very narrow, gilvo-ferruginous. Stem tall (6—10 cm), entirely white, minutely pilose, base with a small, roundish, sometimes marginate bulb.

Spores oval, 11—$12^1/_2 \times 7$—$7^1/_2\,\mu$. Cystidia pin-headed (head 3—4, body 7—10 μ broad). Basidia 4-spored.

Fig. spec.: (D. A. pl. 513): Hjallese, rye-stubble-field, Aug. 1900.

Not uncommon at road-borders and in fields.

Most authors apply the Friesian name *G. lateritia* to this very distinct species. But the figures in "*Icones selectæ*" and the accompanying description make it evident, that this interpretation hardly can be right. Fries describes the cap of *G. lateritia* as hygrophanous, more or less dark tile-red etc. It is true that some of his figures show a white cap (probably ment to represent the dry state); but the fresh specimen is shown almost rufo-ferruginous. If the white-capped specimens really represent my *G. lactea*; the Friesian picture is a mixture of two species and his name therefore better cancelled.

1a. **G. lactea** forma *semiglobata*.
Differing from the main form by an almost semiglobate cap and somewhat broader gills. Spores and cystidia identical.

Fig. spec.: (D. A. supplem. after pl. 513): Lundeborg, border of road, in grass, Aug. 1926.

Kühner (loc. cit.) suggests that *G. sphærobasis* van Post is a synonym for *G. lateritia* (= *G. lactea*). But the genuine *G. sphærobasis* is a totally different plant, of stoutish habit, with a convex, ochraceous, rather fleshy (4—5 cm broad) cap and a comparatively short stem.

2. **G. teneroides** Peck.
Medium. Cap $1^1/_2$—$2^1/_2$ cm, conic-campanulate, expanding and at last depressed umbonate, of a dull, rufo-fulvous colour, margin minutely striate, when wet (paler and without striation when dry).

Gills narrow. Stem medium, 4—6 cm × $1^1/_2$—2 mm, almost equal (slightly swollen below), light rufous or gilvous, minutely pruinate.

Spores oval, rather narrow, 8—$10^1/_2$(11) × $4^1/_2$—5 μ. Cystidia pin-headed (head about 5 μ, body about 11 μ broad). Numerous similar cystidia on the stem, but no filiform hairs.

Fig. spec.: (D. A. pl. 517): Hjallese, on naked soil, under shrubs, Aug. 1904. — Rather common in grassy places and on naked soil in shrubberies etc.

The description of PECK fits my plant so well that I have no hesitation to use his name. — *G. spicula* Rick. forma *typica* (Kühner) is very close, although of a more vivid colour. But the *Galera spicula* of LASCH is to me a somewhat dubious plant, "growing on trunks and fallen leaves". Besides Ricken describes *G. spicula* as constantly campanulate, while my *G. teneroides* always expands with age. — The *G. spartea* of KONRAD & MAUBLANC (loc. cit.) is very close, if not identical.

3. **G. pubescens** Gill.

Medium (or large). Cap generally $1^1/_2$—2 cm broad, campanulate parabolic, coarsely striate almost to centre, ochre-fulvous, becoming darker fulvous with age, very hygrophanous (alutaceous when dry), often minutely pilose. Gills rather narrow. Stem almost equal (slightly attenuating upward), flushed with the colour of the cap, especially with age, minutely pilose.

Spores oval-ellipsoid, 11—$12^1/_2$ × $6^1/_2$—7 μ. Cystidia: head $3^1/_2$—4 μ, body about 9 μ broad. Basidia 4-spored. Hairs on stem very minute, hyphoid, thin.

Fig. spec.: (D. A. pl. 514): Hesselager, wood of Picea, on the needle-bed, Oct. 1905). Not uncommon, especially in coniferous woods.

On horse-droppings in coniferous woods I have met with a gigantic form of this species with very large spores (15—17 × 8—10 μ). The spores seem to vary considerably in many *Conocybes*.

4. **G. tenera** Fr. (sensu restr.).

Large, medium or small. Cap in the larger forms 2—3 cm broad, campanulate convex, almost without striation (except when absolutely soaked), colour some shade of dull ochre with a flush of dingy fulvous or cinnamon, ochry alutaceous when dry. Gills rather narrow. Stem rather tall, attenuated upward from a small, whitish bulb, minutely powdery, striate, changing from pale honey to subfulvous.

Spores oval, about 11 × 6 μ. Cystidia: head $4^1/_2$—$6^1/_2$, body up to 12 μ broad. Basidia 4-spored. Similar cystidia in great numbers on the stem.

Fig. spec.: (D. A. suppl. after 516): Højsholt near Tommerup, edge of road, Oct. 1937. Rather common in similar localities.

This larger form, which I take as the type, corresponds fairly well to *G. tenera* var. *subovalis* Kühner and *Galera ovalis* Fr. (sensu Bresadola). (But the true *G. ovalis* of FRIES is a sub-annulate, dark ferruginous species).

4a. **G. tenera** forma *convexa.*
Differing from the ordinary large type by a more fleshy, semi-globate-convex cap and duller, dingy brownish colours.

Spores $10^1/_2$—13×6—$6^1/_4\,\mu$. Basidia 4-spored.

Fig. spec.: (D. A. pl. 516): Hjallese, in grass outside a plantation of Picea, Oct. 1905. — Rarer than the main form.

4b. **G. tenera** forma *tenella.*
Smaller than the main form. Cap 0.8—1.3 cm, campanulate, pale clay-brownish ochre. Stem very slender and thin (about 7 cm × 1 mm), concolorous (whitish above).

Spores oval, $10^1/_2$—13×6—$7\,\mu$. Cystidia small (head about 3, body about $7\,\mu$ broad). Basidia 4-spored.

Fig. spec.: (D. A. pl. 515): Hjallese, grassy footpath in a copse, Sept. 1901.

4c. **G. tenera** forma *minor.*
Small. Cap 0.9—1.5 cm, campanulate-semiglobate, ochre brownish when wet and minutely striate $^1/_3$ in (not pubescent), somewhat hygrophanous. Gills rather broad. Stem 4—5 cm × 0.9—1.2 mm, pale above, honey-coloured below, powdery.

Spores ellipsoid, 9—$10 \times 5^1/_4$—$5^1/_2\,\mu$. Basidia 4-spored. Cystidia rather large (head $4^1/_2$—6, body 10—$12\,\mu$ broad). Similar cystidia, but no hyphoid hairs on the stem. Basidia 4-spored.

Fig. spec.: (D. A. suppl. after 515): Kværndrup, on wet humus in a ditch, in wood of old Fagus-trees. Oct. 1937. Not uncommon.

This form is probably identical with *Galera spicula* forma *macrospora* Kühner.

4d. **G. tenera** forma *microspora.*
Very small. Cap 1.2 cm, campanulate, indistinctly striate, pallid brownish clay. Stem whitish.

Spores ellipsoid, small $7^1/_2$—$8 \times 3^3/_4$—$4\,\mu$. Basidia 4-spored. Cystidia: head $3^1/_2$, body about $7\,\mu$ broad.

In a flower-bed on naked soil, late in the season, Odense, Nov. 1937.

All the forms united here under *Galera tenera* are so like each other, except in size, spore-size and size of cystidia, that I cannot see any good reason for giving them specific or even varietal rank. The most divergent type is the small-spored one. But it is not unlikely that the cold weather, late in the season, may account as well for its dwarfish stature as for the smallness of its spores.

5. **G. ambigua** (Kühner) Lange.

Small. Cap 0.6—1.3 cm, expanded conical, coarsely striate almost to the centre by brownish ochre striæ on a paler, ochraceous ground. Gills at first pale, then honey ochre, ventricose. Stem slender (4—$5^1/_2$ cm × 1 mm), flushed with honey-brownish from base up, minutely flocculose and striate (sub lente).

Spores ovate-ellipsoid, 12—$13^1/_2$ × $6^1/_2$—7 μ. Cystidia: head $3^1/_2$—4, body 8—9 μ broad. Basidia 2-spored.

Fig. spec.: (D. A. pl. 520): Hjallese, in grass, green walk in frondose wood, Oct. 1914. — Rather rare.

This little elegant species, which I have known for many years and provisionally named *G. lineata*, had not been mentioned in the mycological literature known to me until Kühner (loc. cit.) described it very exactly, sub nom. *G. siliginea* var. *ambigua*. It is, however, so distinct and so far from the typical *G. siliginea* that I prefer to raise it to specific rank.

6. **G. siliginea** Fr.

Small. Cap 0.7—1.3 cm, semiglobate campanulate, whitish with a slight flush of alutaceous, not hygrophanous and without striation. Gills rather broad, somewhat distant, adnate. Stem about 4 cm × 1 mm, whitish, sub-diaphanous.

Spores oval, $13^1/_2$—17 × $7^1/_2$—8 μ. Cystidia: head very small (3 μ), body 8—10 μ broad. Basidia 2-spored. In specimens collected in 1936 the stem was absolutely glabrous (neither pin-head hairs nor hyphoid ones).

Fig. spec.: (D. A. pl. 519): Hjallese, border of road through wood, June 1905. Not uncommon, chiefly on grassy road-borders.

This little species has the stature of *Psathyrella atomata*. Kühner, referring to J. Schaeffer, uses the name *G. siliginea* for a number of forms mutually differing in almost every way: large and small, blackish or ochry-fulvous, 2- or 4-spored, with or without a root. None of these seems to be the Friesian *G. siliginea*, characterised by a pallid, slightly pruinose stem and a globoso-campanulate, somewhat grayish cap without striation. Rea's description is good, but for the rather low figures given for the spores.

7. **G. Rickenii** J. Schaeffer.

Medium. Cap 1.5—2.5 cm broad, 1—1.7 cm high, conic-campanulate without striation, whitish with a tinge of dingy honey or pale clay. Gills narrow. Stem about equal (without bulb), 4—7 cm × 2—$2^1/_2$ mm, whitish, soon becoming dirty brown from base up.

Spores ellipsoid-oval, 15—17 × 8—10 μ. Cystidia pin-headed. Basidia 2-spored.

Fig. spec.: (D. A. pl. 518): Hjallese, on a compost-heap, very numerous, Oct. 1905. Not uncommon in similar localities (stack-yards, manured beds etc.).

J. Schaeffer has described this species in *Zeitsch. f. Pilzkunde* vol. 9, fasc. 9, 1930. Ricken describes it very well, but under the erroneous name *G. pygmæo-affinis*. It is highly probable that *Bolbitius conocephalus* (Bull.) Fr. is identical, although Fries describes it as hygrophanous and white-stemmed.

II. PHOLIOTINA.

8. **G. appendiculata** Lange & Kühner.
Small. Cap 1—$1^1/_2$ cm, at first campanulate, then expanding, slightly umbonate, alutaceous ochre, edge pale and faintly striate (whitish when dry), edge appendiculate with small, white, triangular fragments of the membranous veil. Gills almost free, broad, moderately crowded, whitish then ochry. Stem 3—5 mm × $1^1/_2$ mm, white, becoming slightly brownish below, powdery above, minutely flocculose towards the base.

Spores ovate ellipsoid, $7^1/_2$—8 × $4^1/_2$ μ. Cystidia crowded, bottle-shaped hair-shaped, obtuse, 8—10 μ broad below. Cuticle of cap parenchymatic, made up of roundish, 10—20 μ broad cells.

Fig. spec.: (D. A. pl. 509): Hjallese, on the ground, in copse, Oct. 1898. Common, especially at road-edges, on naked soil and amongst grass, in woods and other shady places.

G. ravida Fr. is very close. But the constantly light ochraceous colour of the present species distinguishes it from the dusky *G. ravida*. Ricken's *G. ravida* is probably identical, although he erroneously depicts it both with a ring on the stem and an appendiculate veil.

9. **G. brunnea** Lange (*G. intermedia* var. *brunnea* Kühner).
Small. Cap 0.9—1.4 cm (more rarely about 2 cm), convex, somewhat fleshy, bay-brown, minutely striate at the edge (somewhat paler, clay-brown when dry), ornamented with minute, white, fugacious scales near the edge. Gills broad, ventricose, free, ferruginous brown. Stem 4 cm × $1^1/_2$—3 mm, fistulose, yellowish brown, darker towards the base, flocculose (flocci paler than the stem).

Spores ellipsoid ovate, $6^1/_2$—7 × $3^3/_4$—4 μ. Cystidia rather sparse, inflated below (7 μ), protracted into a long, thin neck, terminating in a globose, about 4 μ broad head. Basidia 4-spored.

Fig. spec.: (D. A. pl. 511): Kerteminde, growing dispersed amongst grass on a lawn, under Populus. Aug. 1917. Rare.

A somewhat larger and slightly lighter form occurs. Kühner (loc. cit. pag. 143) treats this species as a variety of *Pholiota intermedia* A. H. Smith, although the author describes this Agaric as annulate and xylophilous. They are better kept apart.

10. **G. vestita** Fr.
Medium. Cap $1^1/_2$—3 cm, convex (somewhat campanulate at first), hygrophanous, honey-fulvous or ochre ferruginous, pellucido-striate

(paler and without striation when dry), edge fimbriate from minute, yellowish-white squamules. Gills ochry ferruginous, moderately broad and broadly adnate. Stem rather tall (4—7 cm × $1^1/_2$—3 mm), pallid above and pruinate, soon becoming yellowish brown, bistre towards the base which is white-silky fibrillose.

Spores ovate, rather narrow, $8^1/_2$—$9 \times 5\,\mu$ (or $9^1/_2 \times 5^1/_2\,\mu$). Cystidia hair-shaped bottle-shaped or somewhat fusiform, with a shorter or longer neck. (According to KÜHNER the cuticle of the cap is made up of roundish cells). Basidia 4-spored.

Fig. spec.: (D. A. pl. 510): Tange (Fyn), in Alnus—Salix cinerea bog, on moist ground. Oct. 1914. Rare.

11. **G. Mairei** Kühner.

Very small. Cap 0.5—1 cm, conically convex or slightly umbonate, pale tan ochraceous, striate (alutaceous, slightly powdery when dry). Veil absent. Gills very broad, ventricose, almost free, ochre ferruginous, edge whitish, rather distant. Stem $1^1/_2$—2 cm × 0.6—0.9 mm, everywhere white-powdery, whitish.

Spores ovate ellipsoid $(5^1/_2)\,6$—$7\,(7^1/_2) \times 3$—$3^3/_4\,\mu$. Cystidia subulate hair-shaped, acute, base somewhat inflated (5—7 μ broad). (According to KÜHNER the cuticle of the cap is cellular with numerous cystidia with inflated base and hair-shaped appendage, and the powder on the stem is made up of cystidia like those on the gill-edge.)

Fig. spec.: (D. A. pl. 523): Hjallese, on naked soil under Ribes grossularia, Nov. 1897. Rather rare in fields and gardens amongst grass or small shrubs.

A very characteristic little species, easily overlooked. I described it as early as 1897 (in lit.) under the provisional name *Galera pusilla*, but now accept the name published by KÜHNER in 1935.

12. **G. pygmæo-affinis** Fr.

Large. Cap 2—$4^1/_2$ cm, campanulate convex, expanding, ochraceous with a flush of tan-colour, paler (almost alutaceous) and wrinkled all over when dry. Gills pale, becoming ochry ferruginous, narrow and almost free. Stem equal, rather tall (6—9 cm × 3—4 mm), everywhere powdery and distinctly striate, constantly white. Veil absent.

Spores ellipsoid ovate, 7—$8 \times 4\,\mu$. Cystidia hair-shaped, base somewhat inflated (up to 9 μ), about 40 μ long. Cuticle of cap made up of roundish, 12—26 μ broad cells with dispersed cystidia of the same type as those on the gills.

Fig. spec.: (D. A. pl. 521): Hunderup (Fyn), gregarious about a stump (Populus?), in grass, frondose wood, Oct. 1903. — Not uncommon, solitary or in small fascicles in woods, behind hedges, even amongst grass.

Although very well characterised by FRIES this species has been

much misunderstood. RICKEN applies the name to *Galera Rickenii*. COOKE, who figures a small form on pl. 481 of his "*Illustrations*", depicts a larger form on pl. 478 under the name of *Naucoria striæpes*.

III. GALERINA.

A. BRYOGENÆ.

a. SPHAGNICOLÆ.

13. **G. paludosa** (Fries) Kühner.
Rather small to medium. Cap 1—2 cm, conically convex, expanded-umbonate, striate about half way in, honey-colour to gilvous, striæ slightly ferruginous, when young minutely flocculose (flocci innate, adpressed), hygrophanous. Gills almost horizontal, adnate to sub-decurrent, pale at first. Stem very long, prolongated in the substrate, pallid, upper half clad with white, cottony flocci which under the cap form a spurious, fugacious ring. Apex minutely powdery.

Spores ovate sub-limoniform, $9—11 \times 6—6^1/_2\,\mu$. Cystidia almost cylindrical, obtuse, total length about $30\,\mu$, apex 5—6, base about $9\,\mu$ broad. Basidia 4-spored. Cuticle of cap formed of coarse, septate fibrils; individual cells $50—60 \times 6—20\,\mu$, yellowish.

Fig. spec. (D. A. pl. 403): Gerup Skov, Holstenshus, in Sphagnum in a swamp, July 1898. Not uncommon in Sphagnum-tufts, chiefly in the summer-months.

This species was placed in *Tubaria* by FRIES on account of its sub-decurrent gills. With KÜHNER I prefer to transfer it to *Galera*, in the vicinity of *G. sphagnorum*.

14. **G. sphagnorum** (Pers.) Fr. (sensu Konrad & Maublanc).
Medium. Cap $1^1/_2$—2 cm, campanulate convex, then expanded umbonate or even somewhat depressed, honey fulvous, edge minutely striate, hygrophanous. Gills concolorous, emarginate. Stem rather long, attached to the Sphagnum in which it grows, pale gilvous, pruinoso-flocculose all over. Almost without any smell.

Spores ovate ellipsoid, $9—10 \times 5—5^1/_2\,\mu$. Cystidia hair-shaped, thin, with a minute pin-head at the apex, slightly thickened downward. Cuticle of cap formed of allantoid or cylindrical, often irregular, $10—20\,\mu$ broad cells. Cystidia on stem similar to those on the gill-edge.

Fig. spec.: (D. A. pl. 525): Gerup Skov, Holstenshus, in Sphagnum-tufts. June 1903. — Rather common, always attached to Sphagnum and appearing early in the season.

KÜHNER calls this species *G. tibiicystis* Atk., reserving the name *G. sphagnorum* for another form with broadly adnate gills and a farinaceous taste.

β. MUSCICOLÆ.

15. **G. rubiginosa** Fr. forma *major* (Fr.).

Rather large. Cap $1^1/_2$—3 cm, at first somewhat campanulate, then convex, indistinctly umbonate, gilvo-rubiginose (striæ rufo-fulvous), coarsely striate almost to centre (ochry when dry). Gills broad, ventricose, adnate, distant, becoming somewhat ferruginous. Stem 4—7 cm × 2—3 mm, rubiginose with age, minutely powdery at apex.

Spores oval-ovate, 9—$9^3/_4$ × $5^1/_2$—6 μ (or $9^1/_2$—10 × 6 μ). Cystidia hair-shaped, slightly swollen towards the base and with a minute, $2^1/_2$—4 μ broad head. Basidia 4-spored.

Fig. spec.: (D. A. pl. 526): Rudme (Fyn), in moss on an old stump (of Ulmus), Jan. 1913. — Also met with outside a plantation of Picea, in moss.

Very well described and figured by FRIES ("*Icones sel.*", tab. 128^3). It may be a distinct species.

16. **G. hypnorum** (Batsch).

Small. Cap about 0.6—0.9 cm, sub-papillate, campanulate to semi-globate, coarsely striate (ground ochry, striæ gilvous). Gills broad, ventricose, somewhat adnate, rather distant, concolorous. Stem almost filiform, 3—5 cm × 0.8 mm, tinged ferruginous gilvous from base up.

Spores ovate, 9—11 × 6 μ. Cystidia 40—45 μ long, obtusely subulate, base 8—10 μ broad.

Fig. spec.: (D. A. pl. 524): Hjallese, in moss at the foot of an old tree (Fagus), Oct. 1896. — Rather common in moss, especially around old trees.

A slightly larger, deeper coloured (almost rubiginose) form, which is met with in deep moss in coniferous plantations, forms a transition to *G. rubiginosa* (Pers.) Fr., as depicted by COOKE. — KONRAD & MAUBLANC's figures of *G. hypnorum* according to KÜHNER probably depict *G. mniophila.*

17. **G. mniophila** (Lasch).

Rather small. Cap 1.0—1.7 cm, campanulate or somewhat conically convex, dingy honey-coloured, striate about $^2/_3$ in, striæ slightly dusky. Gills somewhat crowded, ascendent, adnate, at first somewhat livid, then ochry. Very hygrophanous. Stem slender, thin (about 7 cm × $1^1/_2$ mm), hyaline whitish above, faintly yellowish below, apex minutely powdery, slightly fibrilloso-flocculose towards the base. No veil. Inodorous.

Spores amygdaliform, 10—$11^1/_2$ × $5^1/_2$—6 μ. Cystidia almost cylindrical, obtuse, slightly capitate, base 6—8 μ, midway about 4 μ broad, total length 35—50 μ. Basidia 4-spored.

Fig. spec.: (D. A. suppl. after 524): Kirkeby, Oct. 1936.

Not uncommon, in deep moss (Hypna, Hylocomium etc.), open spaces in plantations of Picea, somewhat gregarious.

18. **G. mycenopsis** Fr. (sensu Ricken and Kühner).
Rather small or medium. Cap 1.2—2 cm, campanulate-convex or convex, always obtuse, coarsely striate about half way in, of a vivid fulvous-ochry colour, hygrophanous. Gills broad and broadly adnate, sometimes with a decurrent denticle, concolorous. Stem generally rather long (especially among rank mosses), 5—8 cm × $1^1/_2$—2 mm; its fundamental colour paler than the cap, covered more or less, especially when young, by a whitish, silky-fibrillose coating which extends to the bud, but soon disappears. Apex of stem powdery.

Spores ellipsoid, $9^1/_2$—10 × 5—$5^1/_4$ μ. Cystidia cylindrical or slightly swollen below, obtuse. 45 × 6—7 μ (below), 4 μ (above).

Fig. spec.: (D. A. 2. suppl. after 524): Ny Stenderup, in deep moss, open space in plantation of Picea, Sept. 1936. Common, often rather numerous, in similar localities in woods of Picea and Pinus.

Distinguished from *G. mniophila* by the more vivid colours and the silky fibrils on the cap while in bud.

B. HUMIGENÆ.

19. **G. clavata** (Vel.) Kühner.
Rather small. Cap about 1 cm, conical, then expanded, with a small umbo, gilvous, indistinctly pellucido-striate, ochre when dry. Gills broad, ventricose, rather distant, adnate, ochry. Stem 4—6 cm × $1^1/_2$—2 mm, pale honey, lighter above, minutely flocculose, slightly fibrillose towards the base, rather fragile. Some few evanescent fibrils connect the budding cap with the stem.

Spores ovate ellipsoid, $12^1/_2$—$13^1/_2$ × 6—7 μ. Cystidia flask-shaped with a shorter or longer neck and a 6—7 μ broad, roundish head (body about 14, neck about 4 μ broad). Basidia 4-spored, about 12 μ broad; sterigmata rather coarse.

Fig. spec.: (D. A. pl. 527): Lundsgård, Kerteminde, on old lawn, in grass, outside a wood of Fagus, Aug. 1914.

Not uncommon in similar localities, amongst grass, herbs and moss. This species I have known for the last 24 years under the provisional name *G. pseudo-hypnorum*. Velenowsky regards it as a variety of *G. fragilis* Vel. — It is easily distinguished by the large spores.

20. **G. graminea** Vel.
Rather small. Cap 1.2—1.6 cm, convex expanded, with a small umbo, light ochry with darker, ochre-gilvous striæ (alutaceous and without striation when dry). Gills rather broad, rotundate or

slightly emarginato-adnate, not crowded. Veil absent. Stem $3^1/_2$ —4 cm × 1—$1^1/_2$ mm, sub-diaphanous, whitish with a flush of ochraceous, slightly powdery at apex, base white-tomentose, fragile.

Spores ovate ellipsoid, almost hyaline, $7^1/_2$—9 × $4^1/_2$—5 μ. Cystidia hair-shaped, thin, apex slightly capitate, base a little inflated (total length 40 μ, head about 3 μ). Basidia 4-spored. Cuticle of cap made up of 5—6 μ broad fibrils.

Fig. spec.: (D. A. suppl. after pl. 526): Husmandsskolen, Odense, on old lawn, amongst grass and moss, Nov. 1929. Rather rare, in grass, on lawns and road-borders, generally late in the season (Oct.-Dec.).

21. **G. subtilis** Lange n. sp.

Very small. Cap 0.3—0.4 cm broad, campanulate, pellucido-striate almost to the top, gilvous, whitish-ochre when dry. Gills rather narrow, ascendent, adnate, gilvo-ochraceous, rather distant. Stem 2 cm × 0.5 mm, smooth, somewhat gilvous towards the base.

Spores somewhat obliquely ellipsoid or sub-limoniform, indistinctly rough, 10—$5^1/_2$ μ, yellow. Cystidia flask-shaped, subcapitate, total length about 50 μ, body up to 14, neck 5 and head 6 μ broad. Basidia 2-spored.

Fig. spec.: (D. A. pl. 528): Ubberud, in meadow-land behind a plantation, amongst grass and herbs, Oct. 1919.

This pygmean species has some traits in common with *G. clavata*, particularly the flask-shaped cystidia; but the spores and especially the basidia are much smaller. It should be further studied.

22. **G. Sahleri** Quél.

Very small. Cap 0.3—0.7 cm broad, conical, acuminate, fulvous (almost bay-brown at the top), lower half sparsely clad with minute, white, silky fibrils. Gills very broad and broadly adnate. Veil arachnoid. Stem paler than the cap, with dispersed white fibrils, about 2 cm long.

Spores ovate ellipsoid, $9^1/_2$—11 × 5 μ. Cystidia hair-shaped. Basidia 4-spored.

Fig. spec.: (D. A. pl. 512): Gerup Skov, Holstenshus, gregarious under Salix cinerea on the ground amongst interwoven roots, Sept. 1904.

A very characteristic species. The nearest approach to it seems to be a species described by Josserand sub nom. *Naucoria camerina* Fr. (?) sensu Quél. (vide Kühner, loc. cit. p. 212), but which is far from *N. camerina* as commonly understood.

23. **G. nana** (Petri) Kühner.

Small. Cap 0.6—0.8 cm, almost semiglobate, hygrophanous, dark ferruginous and coarsely striate when fresh (ochry honey-colour when dry). Gills rather distant, very broad and broadly adnate

to slightly decurrent, dark ochry ferruginous. No veil. Stem short (2 cm × 1 mm), ferruginous-bay (pale above), sparsely clad with white fibrils in lower half; apex slightly flocculose. Spore-powder ferruginous.

Spores obliquely elongated ellipsoid, about $10^1/_2 \times 5\,\mu$, yellow. Edge and face of gills set with thick-walled, bottle-shaped fusoid, about 10—13 μ broad cystidia, the obtuse top of which is covered with a hood of crystals (almost as in *Inocybe*). Basidia 2-spored.

Fig. spec.: (D. A. suppl. after pl. 505): Hjallese, on the ground behind a wooden frame, Sept. 1924. — Also on record from Jylland.

I first referred this species to *Tubaria* (on account of its sub-decurrent gills) under the name of *Tubaria cystidiosa*, but now accept the name applied to it by Kühner 1935.

24. **G. badipes** (Fr.) Kühner.

Rather small. Cap 1—1.8 cm, campanulate convex to convex, hygrophanous, ochry honey-colour, distinctly striate about $^2/_3$ in. Gills broadly adnate, ochre ferruginous. Stem 3—4 cm × 2 mm, ochry honey above, shading off through ferruginous bay to almost blackish brown at the base, minutely white-silky fibrillose in lower half. (Some few fibrils may also be seen on the bud).

Spores obovate, $9^1/_2$—$11 \times 5^1/_2$—$6\,\mu$. Cystidia 25—40 μ long, bottle-shaped hair-shaped with a shorter or longer neck, body about 10 μ broad. Basidia 2-spored.

Fig. spec.: (D. A. pl. 487 A and B): A: Tommerup, on twigs and sticks in plantation of Picea, June 1898. B: Årup, on twigs and needles in wood of Pinus, Oct. 1911. — Not uncommon.

This species has some traits in common with *Pholiota marginata*, but no trace of a ring. Microscopically it recalls the following species. Fries describes *Naucoria badipes* with a floccoso-fibrillose stem, while his *N. camerina* is only slightly fibrillose. My finds are exactly intermediate or rather more like the description given for *N. camerina*. Probably the two are not specifically distinct. To avoid confusion I use the same nomenclature as Kühner.

25. **G. vittæformis** Fr.

Small. Cap 0.5—1.2 cm broad, campanulate, sometimes with a small umbo, hygrophanous, ochry honey or with a tinge of ferruginous, striate almost to the top. Gills ascendent, concolorous. Stem concolorous above, rufo-ferruginous below, everywhere minutely setulose by microscopical bristles.

Spores obovate, $8^1/_2$—$10^1/_2 \times 5^1/_2\,\mu$ (more rarely up to 11—12 μ long). Cystidia Urtica hair-like, base 10—16 μ broad, total length 50—60 μ. Basidia 2-spored. The cystidia on the stem are almost like those on the gill-edge.

Fig. spec.: (D. A. p. 522, A & B): A: Tommerup, mossy walk in plantation of Picea, June 1898. B: Årup, dense plantation of

Picea, on the needle-bed, Oct. 1904. — Not uncommon, in coniferous woods, often — but not always — amongst moss.

Although this species is commonly found growing in mossy places, I do not place it in *Bryogenæ* — as done by FRIES — on account of its connection with *G. badipes*. KÜHNER describes this 2-spored species sub nom. *G. muricellospora* Atk.

Besides the species described above some few others are on record in Danish mycological literature, but so inadequately described that they had better be excluded until verified by new finds.

THE GENUS BOLBITIUS.

Bolbitius, as delimitated by FRIES, is a rather heterogeneous genus. *B. hydrophilus* is now transferred to *Hypholoma*, other species are Galeroid or Coprinoid, and the rest, all the genuine Bolbitii, may be looked upon as mere varieties of *B. vitellinus*. Like many other coprophilous fungi it varies exceedingly in size and stature according to habitat. The subviscid, more or less fisso-sulcate cap distinguishes *Bolbitius* from *Galera* (*Conocybe*); the non-diffluent gills and the yellow spores separate it from *Coprinus*.

SYSTEMATIC AND FLORISTIC NOTES.

1. **Bolbitius vitellinus** (Pers.).

Cap, when expanded, up to 5 cm broad, campanulate or acorn-shaped, then expanding, often subumbonate, pale or vivid chrome-yellow, smooth, then more or less distinctly fisso-sulcate. Gills rather narrow, almost free, becoming ochry ferruginous. Stem whitish, more or less powdery-flocculose, generally rather tall and slender.

Spores oval, 13—15 × 7—9 μ, yellow. Cystidia flask-shaped, with a longer or shorter neck, occasionally almost bladder-shaped, 15—20 μ broad. Basidia 4-spored. Cuticle of cap formed of coarse, thin-walled, hyaline fibrils and vesiculose, balloon-shaped, 10—16 μ broad cells with a shorter or longer, narrower basal part. The basidia are separated by vesiculose, larger, sterile "paraphyses").

Fig. spec.: (D. A. pl. 768—769): Sanderum, on the ground in manured grass-land, July 1897. — "Fruens Bøge", on a heap of rotten foliage, Sept. 1897. — Very common in various parts: on horse-droppings and other manure, on rotten straw and sacking, amongst grass, even on heaps of dry sea-weed at the sea-shore.

This species varies extraordinarily from pygmean, almost membranaceous forms (cap about 1 cm broad) to somewhat fleshy, larger forms with an almost smooth cap of a duller, more livid colour. I have even met with a very robust form, the cap of which was almost clay-brown and wrinkled, especially at the disc. *B. fragilis*, *B. Boltonii*, *B. grandiusculus* may be such forms, the specific value of which is very problematic. — *Bolbitius tener* as described by SEV. PETERSEN (*Danske Agaricaceer*, p. 367) evidently is *Galera lactea.*

THE GENUS PLUTEOLUS.

The little genus *Pluteolus* is intermediate between *Galera* and *Pluteus*, but is next in kind to *Bolbitius*. The tissue of the cap is distinct from that of the stem, like in *Pluteus*, and like the Plutei *Pluteolus* is xylophilous.

The two Friesian species are very intimately related. I regard them as varieties only.

SYSTEMATIC AND FLORISTIC NOTES.

1. **P. aleuriatus** Fr.

Cap 2—3 cm, convex flat, becoming depressed, viscid, minutely striate about $^1/_3$ in, livid grayish with a tinge of lilac. Gills whitish then salmon flesh-colour or somewhat cinnamon, rather narrow, free. Stem 3—4 cm, fragile, often curved, white, minutely flocculose.

Spores ellipsoid, rather narrow and oblique, $9—10^1/_2 \times 4—5\,\mu$, light brown. Cystidia cylindrical, slightly thicker toward the base (9—10 μ broad). Trama of gills formed of parallel, cylindrical, 12—25 μ broad hyphæ. Basidia 4-spored, $6^1/_2—7\,\mu$ broad, surrounded by sterile cells not much larger than the basidia, but set in a lower plane.

Fig. spec.: (D. A. pl. 529 A & B): A: Hjallese, on rotten stump (Quercus?), Sept. 1900. B: Trolleborg, rotten stump of Acer, Sept. 1900. — Not uncommon but generally solitary, on rotten frondose stumps and branches.

1a. **P. aleuriatus** var. *reticulatus* (Pers.). *P. reticulatus* (Pers.) Fr.

Differing in having a venoso-reticulate cap, generally of a slightly more violaceous livid colour.

Fig. spec.: (D. A. pl. 529 II): Åløkkeskov, Odense, Aug. 1934. — In similar places as the main form, but rarer.

THE GENUS CREPIDOTUS.

The species of Crepidotus which have more or less pinkish spore-powder are sometimes set apart in a particular genus *Claudopus*; but I prefer to reserve this name for the angular-spored species which find their right place in *Rhodophyllus*.

Crepidotus is next in kind to *Pleurotus*, but fairly distinct from this genus. *Pleurotus pubescens* (Sow.) Schroeter may, however, be mistaken for a *Crepidotus* on account of its slightly pinkish or ochry gills; and *Pleurotus mutilus* may even have its right place in this genus. — *Crepidotus haustellaris*, the only species with a distinct stem, is evidently a near relation of *Naucoria effugiens*; but the rest of the species are without connection in other genera.

The spores are generally ellipsoid, rarely globate. The gill-edge is always set with cystidia, but none of a very outstanding character. — *C. haustellaris* is the only 2-spored species known to me.

KEY

TO THE SPECIES FIGURED.

A. Lateral or resupinate, almost sessile species.
- *α* Rather large species (cap rarely below 3 cm) with dusky cinnamon spore-powder.
  - 1. Flaccid, somewhat gelatinous, glabrous species ..... 1. *C. mollis.*
  - 2. Cuticle silky-fibrillose or squamulose.
    - a. Cuticle silky-fibrillose .... 2. *C. autochthonus.*
    - b. Cap with dispersed, adpressed, rufescent squamules . *C. calolepis.*
- *β* Smaller species with ochry or somewhat flesh-coloured spore-print.
  - 1. Spores ovate or ellipsoid, glabrous.
    - a. Cap almost naked, white with a slight tinge of yellow. Spores 7—9 μ long .... 3. *C. pubescens* (Bres.).
    - b. No yellowish tints. Spores shorter.
      - * Spores narrow ellipsoid, about 3 μ broad .. 4. *C. variabilis.*
      - ** Spores roundish-ovate, about $6 \times 4^3/_4 \mu$............. 4a. *C. variabilis* var. *subsphærosporus.*
  - 2. Spores almost spheric, minutely prikly-punctate 5. *C. sphærosporus.*

B. Small species with a distinct, short, lateral stem .. 6. *C. haustellaris.*

SYSTEMATIC AND FLORISTIC NOTES.

1. **C. mollis** (Schaeff.).

Cap 3—7 cm broad, shell- or kidney-shaped, glabrous, somewhat gelatinous, flaccid, pale horn-brownish ochre, almost whitish when dry. Gills pallid, becoming watery cinnamon. Stem rudimentary or entirely wanting.

Spores ovate, $6^1/_2$—$8 \times 4^1/_2$—$5^1/_2\,\mu$. Cuticle made up of viscid, thin, 3—4 μ broad fibrils.

Fig. spec.: (D. A. pl. 530): Vormark, on Populus, Oct. 1895.

Common on decaying wood of various frondose trees, especially Populus. — Often gregarious.

2. **C. autochthonus** Lange n. n.

Cap $2^1/_2$—6 cm, kidney- or shell-shaped, silver-gray whitish, everywhere silky fibrilloso-tomentose, edge incurved, white-felty. Gills crowded, at first whitish, then watery dingy ferruginous. Stem (if present) strigoso-tomentose, white, almost rudimentary. Spore-print dusky cinnamon ferruginous.

Spores ellipsoid ovate, $7 \times 5\,\mu$ (or $7^1/_2$—9×5—$5^1/_2\,\mu$). Cystidia clavate, about 10 μ broad. Cuticle of cap made up of almost parallel, not much interwoven, 4—9 μ broad, septate, hyaline fibrils.

Fig. spec.: (D. A. pl. 531): Hjallese, on the ground, footpath in frondose wood, gregarious, Oct. 1901. — Not uncommon in similar localities, always directly on the ground.

This very distinct species is fairly well described by Schroeter (Die Pilze Schlesiens) sub nom. *Derminus* (*Crepidotus*) *depluens* (Batsch); but almost all other authors use this specific name for an angular-spored Agaric. — *C. applanatus* (Pers.) Fr., as described by Rea, is not unlike my plant, but grows on wood; and *C. applanatus* in the sense of other authors (Bresadola, Karsten) has globate spores. I therefore deem it advisible to introduce a new name. With *C. epigæus* (Pers.) the present species has nothing to do.

C. calolepis Fr.

Cap 2—3 cm broad, reniform, alutaceous, decorated with somewhat imbricate or more dispersed, rufescent, adpressed scales.

Spores ovate or broadly ellipsoid, 6—$7 \times 4^1/_2$—$5\,\mu$. Cystidia hair-shaped, about 5 μ broad.

Not figured. I have only met this pretty little species once, on a branch of Alnus glutinosus (Oct. 1898).

3. **C. pubescens** Bres. (nec al.).

Cap mostly 1—$2^1/_2$ cm broad, reniform, at first somewhat resupinate, cream-white with a tinge of ochry yellowish, almost glabrous, edge slightly pubescent. Gills at first white, then flesh-colour or slightly ferruginous. Stem absent or rudimentary.

Spores ellipsoid, $7^1/_2$—$9 \times 4^1/_2$—$5\ \mu$. Cystidia hair-shaped clavate, 6—10 μ broad. Basidia 4-spored.

Fig. spec.: (D. A. suppl. after pl. 532): Åløkkeskov, Odense, on sticks and branches of Fraxinus, on boggy ground, Dec. 1935. — Rather common on fallen branches of various trees and shrubs (Fraxinus, Pyrus, Sarothamnus etc.), in wet weather even on dead twigs still on the shrub, f. inst. in dense Sarothamnus-clumps.

C. pubescens is macrospically distinguished from the following species by the slightly yellowish cap with almost glabrous edge, microscopically by the larger spores (Bresadola describes them as even larger than mine). *C. scalaris* Fr. (sensu Schroeter) may belong here. I. Favre who describes it very carefully (in *Schweizerische Zeitschr. f. Pilzkunde* XIII p. 145) applies the name *C. terricola* Britz. to it; but Britzelmayrs description does not fit well enough to warrant this nomenclature. Karsten reserves the name *C. variabilis* for this species, regarding the ordinary *C. variabilis* as a variety, varietas *microspora*.

4. **C. variabilis** (Pers.).

Cap $^1/_2$—2 cm, reniform, somewhat resupinate, white, minutely pubescent with a felty-villous edge. Gills white, then ochry flesh-colour. Stem absent or rudimentary, evanescent.

Spores ellipsoid, $5^1/_2$—$6 \times 3\ \mu$ (or $5 \times 2^3/_4\ \mu$). Cystidia hair-shaped clavate, 6—12 μ broad above.

Fig. spec.: (D. A. suppl. after pl. 534): Åløkkeskov, Odense, on twigs of Quercus and on rotten grass-straw in a swamp, Dec. 1935. — Common on various debris till late in the season.

4a. **C. variabilis** var. *subsphærospora* Lange.

Often larger than the main form, up to $3^1/_2$ cm broad, fully expanded specimens often irregular with a wavy and lobed edge.

Spores oval-sphæric, $6 \times 4^3/_4\ \mu$. Cystidia hair-shaped, somewhat nodulose, 5—6 μ broad at apex. Occasionally some few vesiculose, subglobate cells are also to be seen on the gill-edge.

Fig. spec.: (D. A. pl. 533): Hæsbjerg, on sticks and branches of Quercus and other frondose trees, Oct. 1901. — Not uncommon, often imbricate.

The roundish spores characterise this variety well and also distinguish it from the yellowish, not pure white, *C. pubescens*.

5. **C. sphærosporus** (Pat.) Lange.

Cap $^1/_2$—$1^1/_2$ cm, resupinate, reniform or somewhat irregular, whitish, tomentose, edge often somewhat grooved, tomentose-downy. Gills rather distant, whitish, then ochre-brownish with a flush of flesh-colour. Stem generally absent.

Spores spheric or subspheric, $6^1/_2$—8×6—$7\ \mu$, very minutely spinuloso-punctate. Cystidia hair-shaped. Hairs on the edge of the cap thin, flexuose, $2^1/_2$—$3\ \mu$ thick.

Fig. spec.: (D. A. pl. 534): A: Hjallese, on a fallen twig (of Quercus or Populus), Oct. 1901. B: Husmandskolen, Odense, on twig of Ribes, Nov. 1935. — Not uncommon on fallen twigs and dead branches of divers trees and shrubs.

Macroscopically very like *C. variabilis*, but well characterised by the spores, and therefore better treated as a distinct species.

6. **C. haustellaris** Fr.

Cap about $1^1/_2$ cm, reniform, clay-brownish cinnamon, minutely mealy-pubescent, edge even or indistinctly striate, somewhat expallent. Gills broad, rotundate, concolorous. Stem exactly lateral, curved, very short ($^1/_2$ cm), whitish, springing from a small, 3 mm broad, white mycelium-disc. Spore-powder grayish brown.

Spores ovate-oval, $9—9^1/_2 \times 5^1/_2 \mu$. Cystidia hair-shaped, obtuse, apex slightly inflated (about 5μ broad). Basidia 2-spored.

Fig. spec.: (D. A. pl. 532): Hjallese, on a decorticated, rotten branch of Quercus, Juli 1900. — Rare.

Except for the distinctly lateral stem this little species would be placed in *Naucoria*, in the vicinity of *N. effugiens*.

THE GENUS PAXILLOPSIS.

A number of Paxilloid, but pale-spored, species exist which find a fairly natural position in the vicinity of Paxillus (sensu stricto) and for which I propose the collective name *Paxillopsis*.

It is true that Fries used the name *Lepista* for some Paxilloid, but not rusty-spored, species within his collective genus *Paxillus*. But most of these — e. g. *P. Alexandri*, *P. giganteus* and *P. sordarius* — have pure white spores and are better removed to *Clitocybe*; and the name *Lepista* is now by certain authors used for a small group of *Clitocybes* (*C. inversa* etc.) with globose, prickly spores. To use the name *Lepista* for the species in question might therefore lead to confusion, and I deem it expedient to introduce a new generic name.

In *Paxillopsis* I first of all include all the *Clitopili* of Fries which cannot remain in *Rhodophyllus* on account of their non-angular spores. Most of these are by some modern authors placed in a new genus *Rhodopaxillus* together with a number of Tricholomas, but to my mind find a more natural position here, in the subgenus *Clitopilus* Fr. (sensu restr.). — Besides these species *Flammula helomorpha* Fr. and *Inocybe tricholoma* Fr., for which the genus *Ripartites* has been created, may find their place in *Paxillopsis*, using *Ripartites* as a subgeneric name.

The genus *Paxillopsis*, as here delimitated, thus embraces a number of more or less Paxilloid species with pallid (somewhat flesh-coloured or clay-brownish ochry) spore-powder, decurrent, often easily detachable gills, and a central or somewhat excentric stem.

Microscopical characteristics. All the *Paxillopsis* have more or less distinctly punctate or prickly spores, except *P.* (*Clitopilus*) *prunulus*, in which they are smooth with a number of longitudinal grooves (hence the generic name *Hexajuga* (Fayod)). In all the species the individual spores are almost hyaline; but while

the spore-print in *Clitopilus* is of a pale flesh-colour, that of *Ripartites* is a pallid clay-ochre. The shape of the spore varies from subfusiform in *Clitopilus prunulus* to ovate or roundish in the rest of the *Clitopili* and globular in *Ripartites*.

KEY

TO THE SPECIES FIGURED.

I. **Clitopilus.**

Spore-powder pallid with a tinge of flesh-colour or salmon.

A. Spores ellipsoid fusiform, about 10 μ long .... 1. *P. prunulus.*

B. Spores ovate or globate, $< 7\,\mu$ long.

- α Young gills whitish.
    1. Stem everywhere white-flocculose villose .... 2. *P. mundulus.*
    2. Stem almost glabrous, only tomentose at base .... 3. *P. fallax.*
- β Young gills clay-brown .... 4. *P. popinalis.*

II. **Ripartites.**

Spore-powder dingy ochraceous or clay-brownish.

A. Cap convex, more or less depressed umbilicate; edge strigose.. 5. *P. tricholoma.*

B. Cap somewhat gibbous; edge almost naked ...... 6. *P. helomorphus.*

SYSTEMATIC AND FLORISTIC NOTES.

I. CLITOPILUS.

1. **P. prunulus** (Scop.).

Cap 4—9 cm, convex, soon becoming irregularly depressed with a wavy or somewhat lobed edge, often sub-excentric; surface soft, of a dull whitish colour or somewhat alutaceous. Gills white, then somewhat pinkish flesh-colour. Stem short, concolorous with the cap. — Strong farinaceous smell.

Spores ellipsoid fusiform, $9—11 \times 4—5\,\mu$, indistinctly grooved.

Fig. spec.: (D. A. pl. 634): Hjallese, frondose wood, Oct. 1895. Common in frondose woods as well as in the outskirts of coniferous plantations, but generally solitary.

Clitopilus orcella Fr. is hardly anything but a small, sub-membranaceous form of *P. prunulus*, represented by the smaller figures on the plate.

2. **P. mundulus** (Lasch).

Cap 6—10 cm, flat or slightly depressed, tough, thin-fleshed, whitish, glabrous. Gills somewhat crowded, decurrent, sub-dichotomous at the base, becoming pale ochry and at last tinged with flesh-colour. Stem short, tough, whitish, tomentoso-villose all over, tinged somewhat gray inside with age. — Very bitter. Spore-print whitish salmon.

Spores almost globate, $5—5^1/_2 \times 4^1/_4—4^1/_2\,\mu$. Cystidia absent. Basidia 4-spored.

Fig. spec.: (D. A. pl. 635): Søbysøgård, gregarious in wood of Fagus, amongst dead foliage, Oct. 1909. Rare. Met with both in mixed woods (Pinus—Fagus) and in pure Fagus-woods.

The white strands of the mycelium are widely diffused. The blackening of the flesh is often very slow and not very pronounced.

3. **P. fallax** (Quél.).

Cap 2—4 cm, convex or almost flat, white; flesh thin and somewhat tough. Gills narrow, crowded, deeply decurrent, becoming pallid ochry with a tinge of ferruginous flesh-colour, sometimes crisped and bifurcate, easily detachable. Stem short ($1^1/_2$—2 cm), white, almost glabrous, except at the base which is clad with pure white tomentum. Flesh not blackening, inodorous, bitter.

Spores roundish ovate, $4^3/_4—5^1/_2 \times 3^1/_2—3^3/_4\,\mu$, hyaline.

Fig. spec.: (D. A. suppl. after 634): "Slukefter" near Odense, in a hedge, on the ground under Syringa, Quercus etc., Sept. 1922. Rare.

This little species differs from *P. mundulus* by narrower spores, not blackening flesh and smaller dimensions. It thus forms a transition to the still smaller species figured on suppl. after pl. 279 under the name *Omphalia chrysoleuca*(?). Both forms fall within

the conception of *Rhodopaxillus fallax* (Quél.) Maire, and probably *Paxillus orcelloides* Cooke & Massee is synonymous. It is even not unlikely that *Pleurotus mutilus* (pl. 535) is a pygmean form of the same species (vide "Studies" VIII, under *Pleurotus*, where the identity of this species with *Clitopilus cretatus* is discussed).

4. **P. popinalis** (Fr.).
Cap about 3 cm, convex or subumbonate, clay-brown, smooth. Gills decurrent, grayish brown. Stem about 3 cm × 5 mm, somewhat paler than the cap. Strong farinaceous smell. Spore-powder very pale.

Spores almost spheric, $5 \times 4^1/_2 \mu$, very minutely verrucose.

Fig. spec.: (D. A. pl. 636): Krabbesholm, Skive, in grass on hill-side, Sept. 1917. — Rather rare, on lawns, in meadows etc.

Gilbert (*Bull. Soc. Myc. Fr.* vol. 42[1]) calls this species *Rhodopaxillus lutetianus*.

II. RIPARTITES.

5. **P. tricholoma** (Alb. & Schw.).
Cap $1^1/_2$—$3(4^1/_2)$ cm, convex, soon more or less depressed or subinfundibuliform, whitish, becoming pallid, edge more or less distinctly ciliate. Gills decurrent, crowded, narrow, pallid, then claybrownish. Stem 3—4 cm × 2—4(7) mm, whitish, becoming brownish or dirty flesh-colour from base up.

Spores almost spherical, 4—$5 \times 3^1/_2$—4μ, minutely warty-spinulose.

Fig. spec.: (D. A. pl. 637 A & B): A: Vormark, wood of Fagus etc., Oct. 1898. B: (forma *major*), Lammehave near Ringe, wood of Picea, Oct. 1898. — Not uncommon, but often solitary, in frondose as well as coniferous woods.

A very distinct little species, especially when the edge of the cap is densely set with bristles. These, however, soon disappear. Fig. B is an unusually large, robust and bristly form.

6. **P. helomorphus** (Fr.).
Cap 2—3 cm, convex and somewhat gibbous, rather fleshy, white, edge almost naked. Gills narrow, slightly decurrent, becoming clay-brownish. Stem whitish, slightly flushed with brownish tints from base up. Spore-print dingy ochraceous clay.

Spores almost globose, indistinctly angular, $4 \times 3^3/_4 \mu$, minutely warty-punctate.

Fig. spec.: (D. A. pl. 638): Hesselagergaard, wood of Picea, Oct. 1909. Rare. Met with in woods of Picea, on the ground amongst needles.

Fries places this species in *Flammula*, the preceding one in *Inocybe*. They are, however, very intimately related, possibly only varieties of the same species.

Clitopilus cretatus is mentioned under no. 3.

THE GENUS PAXILLUS.

Paxillus, which is here understood to comprise only the first of the two Friesian subgenera (*Tapinia*), was on account of its somewhat Boletoid character set apart by Fries outside the collective genus *Agaricus*. But I transfer his *Flammula paradoxa* — now often called *Phylloporus paradoxus* — to *Paxillus* because it is even more Boletoid in every way than the other species (some authors prefer to remove it from *Agaricaceæ* to *Boletinæ*). *Lepista* — the other subgenus under *Paxillus* in the sense of Fries — has been practically dissolved by removing the majority of the species to *Clitocybe*.

The habit of the several species of *Paxillus* is very different, the most extreme form being *P. panuoides* which even may be somewhat resupinate and forms a transition to *Crepidotus*. All the rest of the species are distinctly stipitate, but generally more or less excentric, with detachable gills. The spore-powder is ferruginous or almost ochraceous, the spores of very different shape.

KEY

TO THE SPECIES FIGURED.

I. **Tapinia.**

Spores ellipsoid to broadly oval.

A. Stipitate species.

- *α* Stem ochraceous to cinnamon, almost glabrous ... 1. *P. involutus.*
- *β* Stem bistre-brown, velutinous .... 2. *P. atro-tomentosus.*

B. Sessile, conchate or somewhat resupinate species ..... 3. *P. panuoides.*

II. **Phylloporus.**

Spores sub-fusiform oblong, Boletoid species.

Stipitate species with yellow ferruginous, anastomosing gills 4. *P. paradoxus.*

SYSTEMATIC AND FLORISTIC NOTES.

I. TAPINIA.

1. **P. involutus** (Batsch).

Cap 6—12 cm, at first convex with a strongly involute edge, then depressed, ochry ferruginous; edge often grooved, villose. Gills decurrent, often anastomosing at the base, easily detachable, almost concolorous, becoming dirty brown when touched. Stem rather short, paler than the cap, central or somewhat excentric.

Spores ellipsoid ovate, $8^1/_2$—$9 \times 5^1/_2\,\mu$.

Fig. spec.: (D. A. pl. 631): Hjallese, Oct. 1895, in mixed frondose wood. Very common everywhere in woods of Betula, especially on boggy ground; but also to be met with under other trees.

2. **P. atro-tomentosus** (Batsch).

Cap 10—15 cm, more or less excentric or even lateral, convex flat, sub-ferruginous to somewhat cinnamon-bay. Gills yellowish ochre, decurrent, crowded. Stem short and stout (2—$3^1/_2$ cm broad), everywhere densely velutinous, dark umber. — Spore-print pallid ochry.

Spores broadly oval, $5^1/_2 \times 3^1/_2\,\mu$, yellowish hyaline.

Fig. spec.: (D. A. pl. 632): Gerup Skov, Holstenshus, at the foot of an old Picea, Sept. 1904. Rather common, especially on stumps of Picea.

3. **P. panuoides** Fr.

Cap 2—10 cm, of very variable size and shape, sub-membranaceous conchiform or even somewhat resupinate, extended, flat, lobed or concrescent, dingy yellow, at first pubescent or slightly tomentose and rivulose. Gills anastomosing, crispate and veined, yellow.

Spores broadly oval, 4—$5 \times 3^1/_4\,\mu$.

Fig. spec.: (D. A. pl. 633): Ålsbo Bakker, on chips in a plantation, Oct. 1899. Not uncommon, on coniferous wood (chips, stumps, poles and beams).

II. PHYLLOPORUS.

4. **P. paradoxus** (Kalchbr.) Quél.

(Described in Studies XI, under *Phylloporus.*)

ADDITIONAL DESCRIPTIONS AND SUPPLEMENTARY NOTES TO PART I—XI OF "STUDIES IN THE AGARICS OF DENMARK".

Since the publication of the first of this long series of monographical papers ("*Studies in the Agarics of Denmark*" I—XII) about 24 years have elapsed. When I started I did not expect to reach the distant goal. But time has been spared me for the task. I have been able to deal with all the genera of Agaricaceæ, to portray the overwhelming majority of the species found in Denmark and to accompany the pictures with descriptions or explanatory notes.

When I published the first paper I could look back on about 20 years of explorations in our mycological flora, and the number of species painted was about 700. But in the ensuing years the study has been extended, my collection of pictures augmented so that now it comprises between 1100 and 1200 species. — A number of these additional species — especially those belonging to genera dealt with before 1930 — have not been mentioned in former parts of "*Studies*", and a supplement is therefore needed. But besides these new descriptions it will be desirable to add some revisional and supplementary notes. 24 years is a long span of time in which alterations and corrections are to be expected. Mistakes in identification and nomenclature can not be avoided, be the work ever so carefully done. The present notes will bring the whole series of papers up to date and augment the usefulness of the work.

A long journey through a partly unexplored territory is at an end. I hope that the trail which I have trod — running parallel with the paths of other students — will be widened by future efforts to a scientific highway.

All the portraits in my collection of water-colours "*Danmarks Agaricaceer*" will be reproduced in "*Flora Agaricina Danica*", of which 3 volumes (out of a total of 5) are now published (the remaining two to appear in 1939—40).

ADDITIONS AND CORRECTIONS.

AMANITA.

(Conf. "Studies" parts II & V.)

Amanita excelsa Fr. forma *maxima*. (*A. Persoonii* Fr. (?)). Twice as large (cap up to 13 cm, stem 16—18 cm); cap whitish pale, dirt-grayish in the centre, almost devoid of mealy patches (while in bud covered with a very thin coating — almost like a bloom — consisting of a single layer of globose cells).

Spores $8 \times 6\,\mu$.

Fig. spec.: ("*Danmarks Agaricaceer*", supplementary plate after no. 13), Håre Bjergskov, Oct. 1930. — Reproduced in "*Flora Agaricina Danica*" plate 4, fig. B. — Rare and solitary in mixed woods.

The description of *A. Persoonii* by Fries fits my specimens like a glove, but the plant hardly deserves a specific name.

LEPIOTA.

(onf. "Studies" parts I & V.)

L. hystrix Møller & Lange.
This is the plant which I in part V described under the name *L. hispida* (Lasch (?)) Fr., but which evidently is a "new species" of which no adequate description seemed to exist till it was described in "*Flora Agaricina Danica*", vol. I.

L. echinacea Lange.
In part II I referred this species to *L. hispida* (Lasch), in part V to *L. fuscosquamea* Peck. But American authors apply the Peckian name to a species with larger spores. — My species is very close to *L. echinella*.

L. echinella Quél.
The two forms of this species which I described in "*Studies*" II I now regard as distinct varieties, which I attach to the two species described by the American authors Peck and Atkinson.

L. echinella var. *eriophora* (Peck) is the dark form which besides by the colour and the felty-scaly coating on the stem differs from the lighter form by having the scales on the cap made up not

only of globate cells but also of long, articulate, 4—9 μ broad hyphæ.

L. echinella var. *asperula* (Atk.) is characterised by its hazel-brown colour and the almost complete want of hyphæ in the scales on the cap.

L. clypeolaria (Bull.) var. *minor* Lange.
In "*Studies*" II I called this form *L.* (*clypeolaria* var.) *metulispora* B. & Br. But *L. metulispora* cannot be upheld as a species distinct from *L. clypeolaria*, and the name should be cancelled.

L. gracilis (Quél.).
In "*Studies*" II I erroneously referred this species to *L. felina.*

L. gracilis forma *major* Lange.
Larger than the typical *L. g.* (cap $3^1/_2$—5 cm, stem 6—7 cm × 5—6 mm). Cap slightly paler, faintly flushed with pale flesh-colour towards the edge.

Spores 10—11 × 5—$5^1/_4$ μ.

Fig. spec.: (D. A. suppl. after pl. 28): Åløkkeskov, under old Fagus, a number of specimens $^7/_{10}$ 1937.

L. alba (Bres.) Sacc. sensu Rea. (*L. clypeolaria alba* Bres.).
I have adopted this name for the species which in "*Studies*" II I called *L. erminea* Fr., chiefly because Krombholz's figure of this species is a fairly good representation of my plant. But the conception of *L. erminea* is too vacillatory.

L. serena Fr.
Rather small. Cap $1^3/_4$—4 cm, at first obtusely conical, then expanded subumbonate, milk-white almost smooth, edge over-reaching. Gills lanceolate, remote from the stem. Stem rather tall, slender, glabrous, with a small, membranous ring.

Spores oblong ellipsoid, 9—10 × $3^3/_4$—4 μ. Cystidia inflated bottle-shaped (body about 15 μ broad), neck shorter or longer, often somewhat wavy, 3 μ broad. Cuticle of cap made up of fibrils of cylindric cells (about 150—200 × 10—15 μ).

Fig. spec.: (D. A. suppl. after 32): Åløkkeskov, under Fraxinus and Betula, on somewhat boggy ground, Sept. 1934.

L. Grangei (Eyre) Lange. (*Schulzeria Grangei* Eyre).
Rather small. Cap 2—4 cm, when in bud somewhat felty-pilose, soon cracked into minute granules which in the middle are dark bluish green, towards the edge somewhat paler on a whitish ground. The squamules soon discolour into almost black (in the centre) or subfuscous (at the margin), while the ground becomes dirty rufescent. Veil chiefly appendiculate. Stem 4—6 cm × 4—6 mm, attenuated

upward, at the base clad with coarse, rufescent hairs, and up to the veil set with bluish green, granular squamules.

Spores projectile-shaped, $8^1/_2$—$11 \times 3^1/_4$—$3^3/_4\ \mu$. Cystidia club-shaped, crowded, 30×6—$9\ \mu$.

Fig. spec.: (D. A. suppl. after plate 34): Langesø, frondose wood, in troops in deep bed of decaying foliage (of Tilia, Fagus etc.), Aug. 1930 (and later years).

L. pseudo-felina Lange.

Very small. Cap 1—$1^1/_2$ cm, campanulate, soot-black, cuticle at first minutely piloso-tomentose then broken up into minute, granular squamules on a whitish ground. Gills not crowded, edge somewhat fimbriate. Stem $4^1/_2$ cm $\times$ 2 mm, whitish, rufescent from base up, with dispersed, blackish, granular squamules below the rudimentary ring.

Spores projectile-shaped, 9—$10^3/_4 \times 3^1/_4$—$4\ \mu$. Cystidia clavate or sub-ventricose, 30—35×8—$9\ \mu$. Hairs on the cap 120—$160\ \mu$ long and about $12\ \mu$ broad, monocellular with grayish contents.

Fig. spec.: (D. A. suppl. after pl. 38): Langesø, solitary in frondose wood, Oct. 1933.

This species differs from *L. castanea* not only by the blackish colour but by the plushy surface of the young cap. It is also close to *L. tomentella.*

L. fulvella Rea. (*L. Boudieri* Bres. sensu ext.).

I described this species in "*Studies*" V sub nom. *L. Boudieri*, because the gill-edge was slightly brownish. Further observations have made it clear to me that this coloration has no systematic value.

L. fulvella forma *gracilis.*

The plant described in "*Studies*" II as *L. helveola* Bres. var. (?) is hardly anything but a gracile form of *L. fulvella.*

L. brunneo-incarnata Chod. & Mart. (sensu restr.).

Rather small. Cap 3—4 cm, slightly umbonate, with a rather thick cuticle which is soot-brown with a tinge of purple, disintegrating (when the cap expands) into squamules which at the disc are rather large and flat, towards the edge granular and paler on a whitish to pale vinaceous ground. Gills cream-white. Stem rather short, 3 cm $\times$ 5—6 mm, pale vinaceous with zones of granular, red-brown squamules up to the whitish (on the lower side coloured) ring.

Spores oval, 7—$9 \times 4^1/_2$—$4^3/_4\ \mu$. Cystidia broadly clavate, about 36×7—$10\ \mu$.

Fig. spec.: (D. A. suppl. 2 after pl. 39): Åløkkeskov, on naked humus, outskirts of wood, Aug. 1934.

Konrad & Maublanc include under *L. brunneo-incarnata* a small-spored species which I think is rather a form of *L. lilacea* or *L. fusco-vinacea.*

L. fusco-vinacea Møller & Lange.
Medium or rather small. Cap up to $4^1/_2$ cm, expanded umbonate. The dark fuscous red-brown, somewhat felty cuticle breaks up (except at the disc) into rather broad, adpressed scales (smaller and somewhat acuminate towards the edge). Subcutaneous tissue fibrous-silky, pale vinaceous. The edge of the cap overreaches the gills with a tomentose brim. Stem rather stout (6 cm × 6—8 mm), densely tomentoso-fibrillose below the ring, which is whitish, fibrilloso-membranous. Colour of stem somewhat vinaceous above, fuscous below.

Spores oval, $4^1/_2 \times 2^1/_2\,\mu$. Cystidia crowded, cylindric clavate, 25—35 × 6—9 mm.

Fig. spec.: (D. A. suppl. 1 after pl. 39): Edge of drive in wood of Picea and frondose trees, among Glechoma etc. on black soil, Næsby, Sept. 1923.

L. subincarnata Lange.
Described in "*Studies*" II sub nom. *L. Fourquignonii* Quél. (in the sense of RICKEN). But according to QUÉLET himself his species has olivaceous scales and must be a different plant.

L. felina Pers. (sensu Rea).
Rather small. Cap about $2^1/_2$ cm, conic convex. When in bud the whole cap is black, the umbo covered by minute, erect, acuminate squamules of agglutinate hairs; but when it expands the cuticle (except at the umbo) disintegrates into minute granules on a whitish ground. Stem rather tall, minutely fibrillose, with dark squamules towards the base and a membranous ring above the middle which is dark gray on the lower side.

Spores ovate ellipsoid, $6^1/_2$—$7^1/_2 \times 3^3/_4$—$4^1/_3\,\mu$. Cystidia clavate to obtusely fusiform.

Fig. spec.: (D. A. suppl. after pl. 40): Ravnholt, solitary on the ground amongst needles in wood of Picea, Oct. 1930.

Most easily distinguished from *L. pseudo-felina* and dark forms of *L. gracilis* by the spores.

L. setulosa Lange.
Described in "*Studies*" V sub nom. *L. minuta*; but this name being preoccupied I now call it *L. setulosa.*

L. cygnea Lange.
Very small. Cap $1^1/_2$—2 cm, campanulate, then expanded, pure white, somewhat silky-fibrillose, edge at last slightly rimose. Gills narrow. Stem 3 cm × 2 mm, glabrous (slightly flocculose at first), with an entire, horizontal ring.

Spores ellipsoid, $6^1/_2 \times 3^1/_2\,\mu$. Cystidia about 45 μ long, cylindrical hair-shaped, obtuse or somewhat capitate, about 7 μ broad. Fibrils of cuticle simple, cylindrical, 10—20 μ broad.

Fig. spec.: (D. A. suppl. after pl. 42): Åløkkeskov, in moist wood on peaty ground, Sept. 1925 (and later years). Also collected in Oregon, U.S.A., in 1931.

L. rufescens (B. & Br.) Lange. (*L. rosea* Rea).
Small. Cap up to 3 cm broad, campanulate convex, densely floccose-mealy with a floccoso-fimbriate edge, cream-white, when touched becoming pinkish flesh-colour in places (with age more rufescent). Stem short (3—4 cm × 3—4 mm), densely floccose-mealy up to the mealy ring, dingy flesh-colour towards the base. The flesh becomes slightly rubescent when cut.

Spores oval, $4^1/_2$—$5 \times 3\ \mu$. Cystidia rather short ($25 \times 8\ \mu$) somewhat club-shaped, sometimes with a short, hair-shaped appendage. The mealy coating consists exclusively of globose cells, 25—50 μ in diameter.

Fig. spec.: (D. A. suppl. II after pl. 53): Åløkkeskov, in small troops in frondose wood, Aug. 1934 (and later years).

L. rufescens was originally regarded as a variety of *L. granulosa* with which it has nothing to do. It is more robust than *L. seminuda* and distinguished from it by the densely mealy-granulate stem and the colouring.

L. Hetieri Boud.
Rather small. Cap semiglobate campanulate, then expanded convex, up to $4^1/_2$ cm, at first whitish, becoming ashy dirt-brownish, somewhat rufescent when old and wet, densely mealy-granulate. Gills whitish, then somewhat grayish. Stem rather tall and slender ($4^1/_2$—6 cm × 3 mm), mealy like the cap. Veil mostly appendiculate mealy membranous. Flesh whitish, rufescent in the stem from base up.

Spores narrow, with truncate base and oblique pedicel, 5—$5^1/_2 \times 2\ \mu$. Cystidia not found. Cells on cap globose, 25—30 μ diam.

Fig. spec.: (D. A. suppl. I after pl. 53): Nykøbing F. (leg. F. H. Møller, Sept. 1934), under old Fagus on boggy ground.

This species has many traits in common with *L. rufescens*, but is more slender, becoming dirty gray or clay-brownish. The spores are narrower.

L. cepæstipes (Sow.) Fr.
Medium to rather small. Cap 2—3 cm high and broad, ovate parabolic, slightly umbonate, at last more expanded, at first glabrous then — except at the umbo — cracking into minute, granular squamules (edge almost naked). The colour is pallid ochre or pallid crust-brown in the middle, whitish towards the edge. The surface soon becomes radiato-striate about 1 cm in. Stem rather slender and thin, 4—7 cm × 3—5 mm, slightly incrassated below, glabrous with a fugacious, membranous, annulate veil. Taste bitterish.

Spores roundish ovate, $6—8^1/_2 \times 4^3/_4—5^1/_2\,\mu$. Cystidia pyriform or somewhat club-shaped, about $15\,\mu$ broad, with or without a short, hairlike, $3\,\mu$ broad appendage. Squamules on cap made up of hyaline, somewhat wavy, $3—6\,\mu$ broad filaments.

Fig. spec.: (D. A. Suppl. after pl. 58): Kragenæs, in troops on fermenting sawdust, 1934 (F. H. Møller & Ebbesen).

L. lutea (Bolt.) Quél.

Rather small, entirely yellow. Cap $1^1/_2$—2 cm high, parabolic, with a prominent, deeper yellow umbo, below the umbo sprinkled with detachable, minute, granular chrome-yellow flocci, becoming striate from edge up and at last splitting after the manner of a Bolbitius. Gills paler yellow, free. Stem concolorous, thin, with a membranous, apical ring and swelled at the base into an ovate, about 5 mm broad bulb. Flesh slightly bitter.

Spores ovate to sub-limoniform, $8—9 \times 5^1/_2—6\,\mu$. Cystidia clavato-vesiculose or inflated fusiform, $25—55 \times 10—15\,\mu$, with pale yellowish contents. Granules on cap made up of oblong cells.

Fig. spec.: (D. A. suppl. II after pl. 58): Ryslinge, very numerous in a hothouse, on peat mixed with leaf-mould, July 1936.

L. Brebissonii Godey. (*L. cepæstipes* var. *cretacea* Grev.).

Medium to rather small. Cap parabolic, 2—3 cm high, then expanded. Disc sepia-gray; the cuticle (from the small hood in the centre towards the edge) disrupting into very minute, dispersed flocci or granules which shade off into whitish towards the edge, on a white ground. When the cap expands the edge becomes minutely and densely striate, later on fisso-sulcate half way up. Stem slender and thin, 6—7 cm × 3—4 mm (above), 5—7 mm (below), almost glabrous, white, hollow. Flesh not bitter.

Spores obliquely ovate, $9—10^1/_4 \times 5^1/_2—6\,\mu$, with a germination-pore. Cystidia inflated club-shaped, about $60 \times 13\,\mu$, without appendage.

Fig. spec.: (D. A. suppl. III after pl. 58): Køge strandskov, in decaying foliage (chiefly of Fagus), Aug. 1934 (leg. M. P. Christiansen).

The last 3 species are representatives of the subgenus *Leucobolbitius* Lange, characterised by the membranaceous, striate or somewhat sulcate cap.

ARMILLARIA.

(Conf. "Studies" II & IX.)

A. irrorata (Quél.) Lange. (*Lepiota irrorata* Quél.).

Cap $3—4^1/_2$ cm, at first semiglobate-campanulate, then expanded gibbous, smooth, creamy ochre or alutaceous crust-brownish. Gills somewhat truncate, free or slightly attached. Stem cylindric to

sub-clavate, rather short and firm (5 cm × 6—9 mm), below the ragged (partly appendiculate) ring granulate from somewhat zonate, minute squamules of a dirt-brownish colour. In moist weather the stem exudes yellowish, shining drops.

Spores oval, 4—$4^1/_2 \times 2^3/_4\,\mu$. Cystidia very dispersed, vesiculose bottle-shaped or vesiculose cylindric, 35×12—$15\,\mu$.

Fig. spec.: (D. A. suppl. 4 after pl. 58): Lellinge, somewhat gregarious under Fagus on the ground (leg. M. P. Christiansen, Oct. 1934.)

A. mellea (Vahl).

With the intention of splitting up entirely the very heterogeneous genus *Armillaria* I (in "*Studies*" II) attached *A. mellea* to *Lepiota* as representative of a subgenus *Armillaria*. But this taxonomy is hardly defensible.

A. focalis and *A. robusta* are described sub *Tricholoma* in "*Studies*" IX, but had better be re-established as true *Armillarias*.

TRICHOLOMA.

(Conf. "Studies" IX.)

T. pessundatum Fr. (sensu restr.).

Rather large. Cap about 8 cm, fleshy, without fibrils, but on the disc somewhat spotted with darker, drop-like, small spots. The colour is rufous, towards the edge somewhat fulvous, margin almost whitish flesh-colour. Gills whitish, slowly becoming tinged with flesh-colour. Stem rather slender and tall (11 × 1.5 cm), whitish, minutely fibrillose-striate, slightly brownish towards the base. Strong smell of meal.

Spores ovate, $4^1/_2 \times 2^2/_4\,\mu$, with a large central gutta.

Fig. spec.: (D. A. suppl. after pl. 69): "Håre Bjerge", solitary in plantation of Pinus and Picea, Oct. 1934.

My plant answers very well to the form figured in Fries: *Icones selectæ* pl. 28 B sub nom. *A. pessundatum* *Stans* forma *montanum*. But the subspecies *Stans* probably had better be discarded. From *T. populinum* Lange (*T. pessundatum *Stans* f. *campestre*) it is clearly distinguished.

T. ionides (Bull.) Fr.

Fig. spec.: (D. A. suppl. II after pl. 95): Ryde skov, Låland, wood of Picea, 1927 (leg. F. H. Møller). The figure is a sketch after Møller's water-colour.

T. inamoenum Fr.

Cap 5—6 cm, convex expanded, whitish alutaceous, a little more brownish in the middle, smooth, edge slightly tomentose. Gills very broad, broadly emarginate, distant, pallid, with a flush of

yellowish. Stem slender (7 cm × 8 mm), yellowish white, smooth, slightly fibrilloso-lineate, somewhat rooting. Smell like that of *T. sulphureum.*

Spores obliquely ovate, $8^1/_2$—$9^1/_2 \times 6$—$6^1/_2\,\mu$.

Fig. spec.: (D. A. suppl. after pl. 94): Frederikshåbs plantage, on mossy ground under Picea, Oct. 1935.

This species is almost a whitish *T. sulphureum*, but pinophilous. From *T. lascivum* it is clearly distinguished by the taller stem, broader and more distant gills and larger spores.

T. acerbum (Bull.) Fr. sensu Rick.

Large and robust. Cap 6—11 cm, convex, at last somewhat depressed, at first pale tan, later pallid cinnamon (edge paler, generally coarsely grooved at the edge, at last slightly felty. Gills crowded, whitish, becoming pallid and at last dingy rufescent from edge in. Stem stout, solid, pallid, somewhat dingy cinnamon below, slightly flocculose above, towards the base with a net-work of fibrils. Flesh firm, without any particular smell, but with a bitterish after-taste.

Spores broadly ovate, $4^1/_4 \times 3^1/_2\,\mu$.

Fig. spec.: (D. A. suppl. II after pl. 89): Langesø skov, open space in frondose wood, Oct. 1934.

Ricken refers this species to the section *Genuina*, while Fries placed it in *Spongiosa.* I think it natural to attach it to *T. panæolum.*

T. amarum (Fr.) Quél. (nec Patouillard). (*Leucopaxillus amarus* Kühner).

Medium. Cap 5—8 cm, convex, soon flat or slightly depressed, rufous bay, fading off towards the margin through rufous tan to alutaceous, edge often wavy and somewhat grooved, surface minutely tomentose. Gills creamy-white, very crowded, thin, slightly emarginate with a decurrent tooth. Stem almost cylindrical, 0.8—1.4 cm thick, short or somewhat elongated, white, minutely floccose-tomentose. Flesh very bitter and with a somewhat farinaceous smell (fainter than that of *T. lascivum*).

Spores broadly ovate to roundish ovate, $4^1/_2$—$5^1/_2 \times 4$—$4^1/_4\,\mu$, not visibly punctate when magnified 600 ×). Edge of gills with thin, hyphoid hairs ($45 \times 2\,\mu$). Cuticle of cap made up of interwoven, pale brown, 3—5 μ broad hyphæ.

Fig. spec.: (D. A. suppl. after pl. 89): Låland, in wood of Picea (leg. F. H. Møller 1935).

T. civile Fr.

Medium. Cap 5—8 cm, convex (irregularly wavy with age), fleshy, dry, glabrous, but not glossy, tan with a flush of flesh-colour, edge paler. Flesh whitish; Gills whitish, slightly alutaceous, emarginate, rather broad, somewhat distant, rotundate. Stem rather tall (8 cm

× 12—15 mm), fleshy fibrous, whitish with an alutaceous tinge. Taste slightly rancid. Smell very faint, recalling Marasmius oreades.

Spores oval ellipsoid, $4^1/_2$—5 × 3 μ. Cuticle of cap made up of interwoven, 2—5 μ broad fibrils.

Fig. spec.: (D. A. suppl. after pl. 93): Kirkeby, amongst grass under Abies Douglasii and Sarothamnus, Oct. 1937.

My specimens have some traits in common with *Clitocybe opipara* Fr. (which Quélet regards as a *Tricholoma*), but the gills are rotundate, almost free. According to Fries *T. civile* has a detachable cuticle, but this is only the case for rather old specimens in my find. *Tricholoma geminum* differs in narrower, arcuate gills, broader, more roundish spores, shorter, more fleshy stem etc.

T. fallax Peck.

Fig. spec.: (D. A. suppl. after pl. 96): Langesø, plantation of Abies, Oct. 1934.

CLITOCYBE.

(Conf. "Studies" VIII.)

C. trigonospora Bres.

Cap 4—5 cm, convex sub-fuliginous umber, edge somewhat paler, minutely innato-fibrillose. Gills somewhat distant, broad, thick, dirt-gray, broadly adnate, slightly emarginate with a minute denticle, edge at last blackish. Stem rather short and tough, whitish above, dirty grayish below, 5—6 cm × 6—15 mm. Flesh white, somewhat grayish in the stem, slowly shading off into blackish tones. — Somewhat fasciculate.

Spores obliquely triangular wedge-shaped, 7—8 × $5^1/_2$—6 μ.

Fig. spec.: (D. A. suppl. after pl. 113 B): Wood of Fagus, Jylland, Oct. 1935 (Poul Larsen).

C. infumata Bres. forma *nana*. (*Tricholoma cinerascens* (Bull.) Rick. var.).

Cap 4—6 cm, convex, dirty gray-brown, minutely lineato-fibrillose (sub lente), and in fully developed specimens with very minute, raised veins. Gills broad, moderately crowded, emarginate, pale gray, slowly becoming fuscous at the edge. Stem white, dirty grayish below, very slightly white-pruinose above, rather short and firm, 4—5 cm × 10 mm, tough. Flesh white, becoming gray in the maggot-holes. Smell and taste slightly rankish.

Spores lozenge-shaped or — in side-view — obliquely lemon-shaped, 8—$8^3/_4$ × 5 μ.

Fig. spec.: (D. A. suppl. after pl. 84): Wood of Fagus, Falster, Sept. 1934 (F. H. Møller).

C. infumata Bres. (*Tricholoma cinerascens* (Bull.) Rick.).

Cap 7—8 cm, expanded, slightly umbonate when young, pallid horn-brownish, expallent, sub lente minutely lineolate by raised

veins. Gills slightly emarginate with a decurrent tooth, rather broadly adnate, pallid (very slowly fuscescent at the edge), rather crowded. Stem rather tall, somewhat rooting, whitish, with minute fibrils, slightly fuscescent, apex indistinctly mealy.

Spores lozenge-shaped or sub-limoniform, base acuminate, $9 \times 5^1/_2\ \mu$. Cystidia absent. Basidia clavate, about $7\ \mu$ broad.

Fig. spec.: (D. A. suppl. II after pl. 113): Krængerup, in wood of Fagus, Sept. 1935.

It has a superficial likeness to *Collybia platyphylla*. It also recalls *C. aggregata*, but is not fasciculate. *Tr. cinerascens* (Bull.) Rick. seems to be identical. Even *C. ectypa* Bres. (nec al.) may belong here.

C. cerussata Fr. var. *pityophila* (Fr.).

Spores ovate, $4—4^1/_4 \times 2^3/_4—3\ \mu$.

Fig. spec.: (D. A. suppl. after pl. 135): Lundeborg, gregarious in plantation of Picea, Oct. 1934.

C. candicans (Pers.) forma *phyllophila* Fr.

Spores ellipsoid, $5 \times 2^3/_4\ \mu$.

Fig. spec.: (D. A. suppl.): Åløkkeskov, on the ground among dead foliage (Alnus, Fagus, Betula), Oct. 1937.

C. ericetorum (Bull.).

Cap $3^1/_2—3^3/_4$ cm, depressed (disc slightly convex, edge involute, irregularly wavy), smooth, alutaceous white. Gills distant, without connecting veins, rather thin, decurrent, white. Stem 3 cm $\times$ 5—6 mm, cylindrical or slightly attenuated downward, glabrous, white, solid, not tough. Smell and taste almost absent.

Spores spheric ovate, $5^1/_2 \times 4^1/_4\ \mu$, with an acute pedicel. Hyphæ of trama very thin ($3\ \mu$), interwoven. Basidia narrowly club-shaped. Base of gills about $340\ \mu$ thick.

Fig. spec.: (D. A. suppl. after pl. 139): Vejstrup, in grass, road-border in copse, on loamy soil (a few specimens), Oct. 1934.

It differs from *Camarophyllus pratensis* by the white colour, about 3 times thinner gills and more ovate spores. *Camarophyllus virgineus* has larger, more oblong spores.

C. sandicina Fr. forma *minor*.

Cap about 1 cm broad, sub-membranaceous, hygrophanous, when fresh of a dingy flesh-colour amethyst (when dry mealy sub-squamulose, more pallid), always without striation. Gills broad behind, subdecurrent, distant, rather thick (not visibly mealy), flesh-colour amethyst. Stem $1^1/_2$ cm, slightly incrassated above ($1^1/_2$ mm), not hollow, smooth, in- and outside brownish flesh-colour with a flush of amethyst.

Spores ovate, with a rather large pedicel, $10 \times 6\ \mu$, smooth. Basidia 2-spored, about $7\ \mu$ broad. Cystidia absent.

Fig. spec.: (D. A. suppl. after pl. 155): Langesø, some few specimens in mixed wood, on the ground (foot-path), Sept. 1932.

The smooth spores distinguish this species from *Laccaria amethystina*. If *Laccaria* be extended to comprise also smooth-spored species, it would find its natural position within this subgenus of *Clitocybe*. — My specimen were considerably smaller than those described by Fries, but for the rest quite typical.

C. (Laccaria) **laccata** var. *proxima* Boud.

Spores ovate-globose, $7^1/_2$—$9 \times 6^3/_4$—$7^1/_2\,\mu$, minutely echinulate (spiculæ about $1\,\mu$ long). Basidia 4-spored. Edge of gills set with dispersed, crispate hairs.

Fig. spec.: (D. A. suppl. after pl. 153): "Sortsø", Gerup skov, in Sphagnum under Betula, Sept. 1934.

C. subinvoluta W. G. Sm.(?) var.

Cap up to 8 cm, at first convex gibbous, at last plano-infundibuliform, edge involute and somewhat grooved, pale flesh-colour or trout-red. Gills rather crowded, strongly decurrent, of a pale yellowish flesh-colour. Stem clavate, rather tall, 10—12 mm broad above, 20—22 mm below, of the same colour as the cap (whitish below). Smell sweetish, faintly aromatic.

Spores spheric-ovate with an oblique pedicel, $6 \times 4^1/_2\,\mu$.

Fig. spec.: (D. A. suppl. after pl. 127): Langesø, wood of Fagus, on humous ground, Oct. 1933.

Cooke (*Illustrations* pl. 177) depicts the same species sub nom. *C. geotropa subinvoluta*. The spores are shown somewhat warty, but this, according to Rea, is a mistake. Bresadola's illustration of *C. geotropa subinvoluta* hardly belongs here.

C. fritillæformis (Lasch).

Cap about 4 cm, at first somewhat depressed umbilicate, then plano-infundibuliform, dirt-brownish horn-colour, somewhat hygrophanous, edge slightly striate (when dry pale, whitish or slightly alutaceous), somewhat flaccid and tough. Gills narrow, truly decurrent, not particularly crowded, occasionally furcate, concolorous. Stem slightly attenuated upward, tough, glabrous, somewhat darker than the cap. Smell reminding of old mushrooms. Taste bitterish, quinine-like.

Spores obovate pipshaped, $5 \times 3^1/_2\,\mu$.

Fig. spec.: (D. A. suppl. after pl. 144): Wood of Fagus, deep leaf-mould, Hareskov, Sept. 1932.

It bears a certain likeness to *C. trullæformis*, and like this species it sometimes becomes difformed with age, with crispate gills.

C. concava Fr. (sensu Bres.).

Cap $2^1/_2$—$4^1/_2$ cm, strongly convex, umbilicate with a profound, rather narrow depression, hygrophanous, without striation, dark

brownish gray (paler grayish brown when dry), comparatively fleshy, rather tough. Gills dirty gray, edge paler, arcuate, decurrent, united at the base, somewhat crowded. Stem short, grayish, paler above, often compressed. Smell and taste almost none.

Spores ovate, $6—6^1/_2 \times 3^3/_4—4\ \mu$.

Fig. spec.: (D. A. suppl. after pl. 142): Søbysøgård, gregarious on the needle-bed in plantation of Picea, Oct. 1935.

It has much in common with *Omphalia umbilicata* which, however, has a more date-brown cap, somewhat larger spores and grows in woods of Fagus.

COLLYBIA.

(Conf. "Studies" III.)

C. radicata (Relh.).
The epiderm of the cap is formed of inflated, obovate or almost balloon-shaped cells (diam. $14—23\ \mu$).

I have gathered a single specimen of this species in wood of *Carpinus*, Langesø 1924.

C. longipes (Bull.).
Tall and rather large. Cap about $5^1/_2$ cm, subgibbous, radiately wrinkled, edge involute, surface fuliginous, velutinous atomate, with a faint whitish bloom. Gills distant, yellowish white, rather thick, somewhat adnate and connected by veins. Stem strongly attenuated upward, about 9 cm high (with a rather long "tap-root"), fuliginous, white-pruinate towards the base, coarsely sulcate. Flesh white, after-taste slightly bitter.

Spores roundish ovate, $8—9 \times 6—6^3/_4\ \mu$. Cystidia (very sparse) obtuse, almost cylindrical or slightly inflated in the middle, $50 \times 10\ \mu$ (apex about $5\ \mu$). Between the marginal cystidia are long, thin hairs. The epiderm of the cap is made up of cylindric-obovate, palisade-like cells ($35 \times 12—16\ \mu$).

Fig. spec.: (D. A. suppl. after pl. 178): Næsbyholm, wood of Fagus, Sjælland 1934 (leg. M. P. CHRISTIANSEN).

Corresponding to the description given by SCHROETER (*Die Pilze Schlesiens*).

C. badia (Lucand) Lange. (*C. longipes* var. *badia* Lucand).
Cap up to 9 cm broad (small specimens only about 3 cm), at first almost globate, then gibbous, expanded or somewhat campanulate, when in bud hazel-cinnamon, when expanded olive-hazel-brown shading off toward the edge to a pale brownish alutaceous. The surface is dry, irregularly pitted-wrinkled in the middle, thinly and minutely felty-velutinous (especially towards the edge) by brown, microscopic bristles. Gills rather broad, distant, rotundate behind and almost free, milk-white. Stem stiff upright, tough,

slightly attenuated upward, towards the base streaked and somewhat grooved, everywhere densely powdered-velvety, fulvous cinnamon, rooting.

Spores almost globular, $10^1/_2 \times 9^1/_2\,\mu$. Cystidia rather sparse, thick-walled, deeply imbedded in the gill-substance, about 90 × 10—15 (apex about 7 μ). Bristles on cap (very dispersed) 250—300 μ long, base 5—6 μ broad, very thick-walled, yellowish brown. Bristles on stem almost of the same dimensions, crowded. The thin cuticle of the cap is formed of upright, ovate cylindric, about 12—18 μ broad cells.

Fig. spec.: (D. A. suppl.): Åløkkeskov, in a ditch in wood of Fagus (2 specimens), Aug. 1937 (leg. Morten Lange).

Although this species has much in common with *C. longipes* it deserves specific rank, especially on account of its microscopic characters.

C. succinea Fr.

Cap 2—$4^1/_2$ cm, convex flat, at first dark fulvous or somewhat rufous, then paler (dingy fulvous alutaceous), the edge in very young specimens slightly pruinate. Gills somewhat distant, rather thick, broad and truncate behind, pallid at first, then with a tinge of the colour of the cap, edge not visibly denticulate. Stem rather short, $2^1/_2$—5 cm, tough, bay-brown, glabrous and shining with a felty, fulvo-cinnamon coating at the base.

Spores ovate, base somewhat acuminate, 6—7 × 3—$3^3/_4\,\mu$. Hairs on edge of gills short, thin, wavy, occasionally somewhat clavate or subcapitate, up to 7 μ broad.

Fig. spec.: (D. A. suppl. after pl. 184): Åløkkeskov, growing gregariously at the base of (or at some distance from) stump of Fagus, Aug. 1922.

A somewhat disputed species. Fries has it from woods of Fagus, but he also records it from coniferous woods in eastern Sweden.

C. erythropus (Pers.) Lange. (*Marasmius erythropus* (Pers.) Fr. (sensu Bresadola)).

Cap 2.6—3.1 cm, plano-convex, very pale tan with a flush of flesh-colour (darkest in the middle), slightly wrinkled. Gills rather distant, whitish, broad behind and somewhat truncate, slightly adnexed. Stem rather slender, 6—7 cm × $2^1/_2$ mm, bright fulvous (almost with a tinge of orange) shining, apex paler, fistulose, glabrous. — Somewhat fasciculate.

Spores elongated pip-shaped, $8^1/_2$—9 × 4 μ, base acuminate. Cystidia of various shape, more or less inflated clavate, obtuse or with a shorter or longer filiform appendage, 7—10 μ broad.

Fig. spec.: (D. A. suppl. II after pl. 184): Tiselholt, growing on a bit of wood buried in the ground, frondose wood, Oct. 1935.

The name *Ag. erythropus* Pers. has been applied to a number of species. Schroeter uses it for *Marasmius cohærens*, and Quélet's

A. e., according to KONRAD & MAUBLANC is *Collybia acervata.* I prefer to place this species in *Collybia.*

C. pseudo-radicata Møller & Lange.
Cap $1^1/_2$—3 cm, convex, horn-brownish pale, silky; flesh thin. Gills not crowded, deeply emarginate, adnexed, white, thin, moderately broad. Stem straight and slender (6 cm × 3 mm), without any root (base with white fibrils) smooth, apex (sub lente) minutely flocculose pruinate, white, slightly horn-brownish towards the base, fistulose, somewhat cartilaginous. Smell and taste almost none.

Spores cylindric phaseoliform, 8—9 × 3—$3^1/_4$ μ. Cystidia coarse, obtusely subulate, inflated below, 60—65 × 5—6 (base 15) μ, rather crowded. Cuticle of cap formed of sub-parallel, thin hyphæ (10—18 μ broad).

Fig. spec.: (D. A. suppl. after pl. 187): Åløkkeskov, growing on sticks and chips in wood of Fagus, Aug. 1934 (leg. MORTEN LANGE).

It has a superficial likeness to small and pallid specimens of *C. radicata* but lacks the root and has a fibrillose cuticle and entirely different spores.

C. velutipes (Curt.) forma *microspora.*
Spores cylindric ellipsoid, 7—$7^1/_2$ × 3 μ. Cystidia inflated fusiform or almost cylindrical, about 90 × 20 μ, mostly obtuse.

Fig. spec.: (D. A. pl. 184 fig. B): Åløkkeskov, on stump of Fraxinus, Nov. 1935.

Only microscopically differing from the ordinary form.

C. ambusta Fr.
Cap 0.8—2 cm (rarely more), convex, occasionally with a rudimentary papilla, becoming almost plane or slightly depressed, sootbrown to almost sepia, edge minutely striate, somewhat paler. Gills moderately crowded and rather narrow, whitish or grayish, adnate (or sub-decurrent). Stem rather short (3 cm) and thin, of the same colour as the cap, paler above, apex slightly mealy. Smell faint, of meal. Taste slightly rancid.

Spores almost globose, $4^1/_2$—5 × $4^1/_2$ μ, contents granular. Cystidia absent.

Fig. spec.: (D. A. suppl. after pl. 197): Ry Mølleskov, on charcoal, burnt ground in wood of Picea, Oct. 1929.

C. atrata appears to me to be almost identical.

C. leucomyosotis Cooke & Smith (*C. palustris* (Peck) A. H. Sm.).
This is the plant figured by me sub nom. *C. clusilis* Fr. sensu Schroeter. The genuine *C. clusilis* is a different species.

C. tylicolor Fr.
I have adopted this name for the species figured by me as *C. tesquorum. C. tesquorum* according to BRESADOLA is a smooth-spored species.

MARASMIUS.

(Conf. "Studies" IV.)

M. candidus (Bolt.).

Spores ellipsoid lanceolate, $9 \times 3^1/_4\,\mu$. Cuticular hyphæ interwoven, 6—8 μ broad, apical cells subclavate.

Fig. spec.: (D. A. suppl. after pl. 935): Åløkkeskov, on twigs and dead grass, Aug. 1934.

Superficially like *M. epiphyllus*, but probably only a sub-etiolated form of *C. ramealis*. *M. insititius* Fr. var. *albipes* Fr. as described by Rea seems to be synonymous.

M. (*Crinipellis*) **stipitarius** (Fr.) Pat.

is a better name than *Collybia stipitaria*, used in "*Studies*" III. *M. epichloe* Fr. seems to be identical, and so, to my mind, is *M. caulicinalis* (Bull.) Quél.

MYCENA.

(Conf. "Studies" I & V.)

M. pura (Pers.) var. *rosea*. (*Agaricus roseus* Fl. D.).

Larger and taller than the type. (Stem about 9 cm × 5 mm.) Cap light pink. Stem concolorous but paler, whitish above.

Fig. spec.: (D. A. suppl. after pl. 230): Hesbjærg, wood of Fagus, Aug. 1932.

M. Iris Berk.

M. amicta Fr. as described by Al. H. Smith (*Mycologia* 1935) only differs in the slightly larger spores.

M. lævigata (Lasch) Fr.(?).

The plant described in "*Studies*" I sub nom. *M. alcalina* var. *nivea* had probably better be called *M. lævigata*. It is, at all events, very close to *M. lævigata* in the sense of Bresadola.

M. sepia Lange.

Rather small species. Cap 0.8—1.2 cm, conic campanulate-parabolic, dark fuscous, edge whitish-pale (disc and striæ almost sepia), minutely striate $^3/_4$ in. Gills narrow, adnate with a small tooth, rather crowded, pale grayish, edge white. Stem about 6 cm × 1 mm, concolorous, (apex white), base with white, crispate hairs.

Spores ellipsoid, $8^1/_2$—$9 \times 4^1/_2\,\mu$. Cystidia pyriform, minutely setulose-warty about 16 μ broad. Basidia 4-spored.

Fig. spec.: (D. A. pl. 258): Gelsted, in wood of Pinus, on the needle-bed.

This species was described briefly in "*Studies*" V under the name of *M. atro-alboides* but is now given a new name, as *M. alboides* is variously conceived.

M. pelliculosa Fr. forma.

Cap 1.2—1.8 cm, campanulate convex, then almost plane, even and of a pale sulphur colour when in bud, becoming pallid with a flush of greenish in the middle and livid gray at the edge, with coarse, dark striation about half way in, when expanded, at last turning entirely gray. Pellicle viscid, detachable. Gills rather thick, broad, connected by veins, pallid. Stem slender (6—7 cm × $1^1/_2$—2 mm), sub-pellucid, livid with a flush of olivaceous, viscous, apex minutely pruinate. Smell faint, somewhat cucumber-like.

Spores ovate ellipsoid, 8—9 × 4—$4^1/_4\,\mu$. Basidia 4-spored. Apex of stem set with obovate, about 9 μ broad, verrucose cystidia.

Fig. spec.: (D. A. pl. 272): Gelsted, in open plantation of Pinus and Sarothamnus, growing amongst rank mosses and tufts of Calluna.

OMPHALIA.

(Conf. "Studies" VIII.)

O. Belliæ Johnst.

Fasciculate, rather small. Cap 1—2 cm, convex, somewhat umbilicate (when old sub-infundibuliform), edge deflexed, coarsely striate or almost sulcate, whitish pale to subfuscous, striæ darker. Gills distant, thick, very decurrent, rather broad, whitish. Stem 2—5 cm whitish, becoming paler or darker fuscous from base upward. Generally a number (2—15) joined in a fascicle, their bases connected by a felty outgrowth.

Spores oblong oval, 11—15 (mostly 12—14) × 6—$6^3/_4\,\mu$. Cystidia absent. Basidia 4-spored.

Fig. spec.: (D. A. suppl. after pl. 295): Bogense, in great numbers on dead reeds of Phragmites, close to the surface of the water in boggy tarn, Jan. 1935 (leg. P. J. Petersen).

Rediscovered almost simultaneously in Germany and Denmark about a century after having been found in England.

O. cinerella (Karst.) Lange.

I have removed this species from *Mycena* to *Omphalia*.

O. grisea Fr. sensu Ricken is synonymous; but Fries' own figure of this species differs widely from it.

O. arenicola Fr.

Cap about 2 cm, flat or somewhat depressed, edge at last slightly upturned, dark brownish gray, silky shining, surface slightly rough to the touch, somewhat transversely cracked with age. Gills dirty yellowish fuscous, rather narrow, somewhat decurrent, moderately broad. Stem rather short (4 cm × 3 mm), slightly lighter than the cap, glabrous, minutely striate (sub lente). Flesh concolorous, with a faint smell of cucumber.

Spores ovate, $6^1/_2 \times 4\,\mu$, indistinctly punctate. Basidia 4-spored. Cystidia small, about $30\,\mu$ long, hair-shaped subulate, base about 4, apex $1^1/_2\,\mu$.

Fig. spec.: (D. A. suppl. after pl. 285): Trente Mølle (Fyn) solitary in moss and grass, open space in plantation of Picea.

O. asterospora Lange forma *fusca*.
Somewhat larger (cap $1^1/_2$—$2^1/_2$ cm) and darker (almost bistre) than the type.

Met with in plantations of conifers, growing in deep moss.

PLEUROTUS.

(Conf. "Studies" VIII.)

P. corticatus Fr. var. *tephrotrichus* Fr.
Differing from the main form by being densely imbricato-squamulose with dark fuscous scales.

Fig. spec.: (D. A. suppl. after pl. 156): Åløkkegården, Odense, on old Æsculus, Oct. 1934.

P. pulvinatus (Pers.)(?).
In "*Studies*" VIII on plate I this species is erroneously called *P. craspedius*.

P. circinatus Fr.
Cap 2—4 cm, almost circular, slightly excentric, convex (disc slightly depressed) with incurved edge, whitish with a silky, but not glossy surface, without striation. Gills about 4 mm broad, plano-arcuate, slightly decurrent, rather crowded, white with a flush of hyaline-grayish. Stem rather short (3—4 cm $\times$ $3^1/_2$—5 mm), tough, concolorous, flushed with pale dirt-brownish from base up. Flesh dry, rather tough. Smell not farinaceous, faint. Taste almost none.

Spores ellipsoid, $6^1/_2$—$7^1/_4 \times 3^1/_4$—$3^3/_4\,\mu$. Cystidia 0.

Fig. spec.: (D. A. suppl.): Kirkeby (Fyn) on an overturned but still fresh stump of Picea, growing between the bark and the wood in a semicircular row, Oct. 1936.

I have seen specimens of *P. circinatus* from Sweden with almost globate spores (4—$4^1/_2 \times 3^1/_2\,\mu$). Which of the two types is the true *P. c.* of Fries is rather difficult to ascertain. The problem should be further investigated.

P. nidulans (Pers.). (*Panus nidulans* (Pers.) Pilát).
Cap 2—5 cm, resupinate or lateral, sessile, edge strongly involute, surface yellowish (when soaked of a deeper orange yellow colour), clad with a velutinous tomentum. Gills narrow, somewhat crowded,

of a rich orange colour. — Spore-powder (when fresh) of a pale, dingy flesh-colour.

Spores small, cylindric virguliform, slightly compressed, $5—5^1/_2 \times 2—2^1/_2 \times 1^1/_2—1^3/_4 \mu$. Edge of gills set with scattered, short, thin, hyphoid hairs.

Fig. spec.: (D. A. suppl. after pl. 161): Låland, growing on old Fagus in wood near Pederstrup (leg. F. H. Møller, Dec. 1929).

P. limpidus Fr.

Pilát has recently re-named my plant *P. Langei*, because he regards *P. limpidus* in the sense of Fries as being merely a reduced form of *P. ostreatus*. But I cannot share this opinion.

P. unguicularis Fr.

Cap 0.5—1.5 cm, at first obliquely campanulate, fastened to the substrate by the upper, narrow part, later expanded, somewhat hoof-shaped, dark fuscous-sepia, slightly shining, the base (especially at first) white-pruinate by a minute, adpressed pubescense. Gills concurrent to an excentric point, distant, rather broad, white, then turning grayish. No genuine stem, but the top of the cap is occasionally drawn out. Flesh gelatinous, dark.

Spores cylindric oval, slightly curved, obliquely pedicellate, $8 \times 4^1/_4 \mu$, generally with two minute drops. Basidia about 7μ broad. The gelatinous part of the flesh is made up of a loose web of thin, 2μ broad hyphæ.

Fig. spec.: (D. A. suppl. after pl. 169): Rude skov near Holte, on a prostrate trunk of Ulmus, gregarious, Sept. 1932 (leg. F. H. Møller).

P. supplicatus Karst.

The small species described in "*Studies*" VIII sub nom. *P. striatulus* Fr. had better be called *P. supplicatus*, as *P. striatulus* is a somewhat dubious species, probably a synonym for *P. applicatus*. *P. supplicatus* is very close to *P. chioneus*, differing in smaller size, striate cap and the not pure white colour.

PANUS.

(Conf. "Studies" IX.)

Panus torulosus (Pers.) Fr.

Occasionally a form of this species is met with, in which the young cap is of a clearer lilac flesh-colour and the edge minutely velutinous (hairs erect, hyaline, about 30μ long). This is a transition to *P. rudis* Fr. — The spores in my specimens of this form were slightly smaller ($5 \times 2^1/_2 \mu$).

VOLVARIA.

(Conf. "Studies" VII.)

V. media sensu Rea.

I have seen specimens from Sweden af *V. media* (Doc. HARRY SMITH, Upsala) with small spores (6×4, exceptionally $8 \times 4^1/_2\,\mu$), but for the rest very much like my plant.

PLUTEUS.

(Conf. "Studies" III & V.)

P. cervinus (Schaeff.) var. *umbrosus* (sensu Bresadola).

I have found this variety in hollow stump of Abies (Langesø 1925). The fibrils on the surface of the cap were formed of cylindrical cells (about 120×9—$15\,\mu$). The marginal cystidia were subfuscous, the cystidia on the sides of the gills were hooked as in the main form.

In mild winters *P. cervinus* may be gathered even in December.

P. phlebophorus Dittm.

Cap about 2 cm, expanded, subumbonate, umber (paler towards the edge), surface everywhere (but particularly in the middle) densely reticulato-venose by furcate, wrinkled, elevated ribs which towards the edge become almost effaced. Stem glabrous, hollow, whitish.

Spores almost globose, 5—$5^1/_2 \times 4^1/_2$—$5\,\mu$. Cystidia inflated, cylindric to broadly bottle-shaped, about $18\,\mu$ broad (on the face of the gills), more variable on the edge. Cuticular cells globose, 20—45 μ diam., with pale brownish contents.

Fig. spec.: (D. A. suppl. after pl. 329): Åløkkeskov, on wet, peaty ground, in wood of Betula etc., Sept. 1925.

P. coccineus (Cooke) Massee. = *P. caloceps* Atk.

This beautiful species was described in "*Studies*" V as a variety of *P. leoninus*. But the genuine *P. leoninus* is a somewhat larger, lion-yellow species which belongs to *Trichodermei*, while *P. coccineus* has a cellular epiderm.

P. chrysophæus forma *gracillima* Lange. (*P. tenuiculus* Quél.).

Cap 1 cm, subumbonate, brown, paler and pellucido-striate towards the edge. Stem very thin ($3^1/_2$ cm $\times$ 0.8 mm), white, smooth, base slightly swelled to a minute bulb. Gills broad, ventricose.

Spores roundish, $5^1/_2$—$6^1/_2 \times 4^1/_2$—$5^1/_2\,\mu$. Cystidia without hooks. Cuticle cellular.

Fig. spec.: (D. A. suppl.): Hjallese, on the ground in frondose wood, Aug. 1937, solitary.

It looks like a small *Mycena*, but is simply a pygmean *P. chrysophæus*.

RHODOPHYLLUS.

(Conf. "Studies" IV.)

1. Entoloma.

R. griseo-cyaneus Fr. (typica).

Fig. spec.: (D. A. suppl. after pl. 334): Næsby, on sloping ground near rivulet, amongst grass and moss, Sept. 1932 (leg. MORTEN LANGE).

R. nitidus Quél. (*Entoloma ardosiacum* Fr. (nec Bull.).

Cap $2^1/_2$—$5^1/_2$ cm, somewhat conical, then expanded with an obtuse or somewhat acute umbo, dark indigo-violaceus with a silky lustre, fading to subfuscous lilaceous when old. Gills originally whitish. Stem comparatively slender, slightly fusiform; fibroso-striate, concolorous; rooting base whitish.

Spores almost globate, indistinctly 5-(6-) angular, about 7 μ diam.

Fig. spec.: (D. A. suppl. after pl. 338): Gerup skov near Holstenshus, under Betula, among Ferns etc., on boggy ground.

A very showy and bright-coloured species; excellently figured by FRIES in "*Icones selectæ*".

R. radiatus Lange.

In "*Studies*" IV I described this species sub nom. *R. elaphinus* Fr.(?) var. *radiatus*.

R. Cordæ (Karst.) Lange.

Cap 3—4 cm, convex, soon slightly depressed around the obtuse umbo, sepia, somewhat paler gray towards the coarsely striate edge (when dry pale dirt-grayish brown), shining, but not viscid, very brittle and thin-fleshed. Gills broad, broadest and somewhat truncate behind, brownish gray, at last with a flush of flesh-colour. Stem rather tall (up to 7 cm × 6 mm), becoming hollow, silky and somewhat fibrillose, grayish pale, base slightly incrassated and whitish. Smell and taste almost 0. Spore-print very pale flesh-colour.

Spores small, subglobose, indistinctly 5-angular, 6—7 × $5^3/_4$—6 μ.

Fig. spec.: (D. A. suppl. after pl. 346): Håre Bjerge, Gelsted, wood of Picea, in deep moss.

A very well defined, pinophilous species. It has nothing to do with *R. costatus* of which KARSTEN in his later works made it a subspecies.

2. Leptonia.

R. cyanulus (Lasch) Lange.

I formerly referred my finds to *R. chalybæus* (Pers.); but this species is said to grow in open spaces and seems to be a stouter type.

III. NOLANEA.

R. staurosporus (Bres.) Lange.
I formerly used the name *R. pascuus* for this species; but this name is a very equivocal one and had better be discarded.

R. papillatus (Bres.) Lange.
This name is preferable to *R. mammosus* (Fr.) forma *tenuior* Fr. used in "*Studies*" IV.

IV. ECCILIA.

R. politus (Fr.) Lange, forma *typica* (*paludicola*) Fr.
Cap $1^1/_2$—$3^1/_2$ cm, convex, umbilicate and at last with a broader, infundibuliform depression, pale horn-brownish livid, coarsely pellucido-striate glabrous and somewhat shining (when dry pale alutaceous, without striation). Gills broad, in most cases slightly emarginate and broadly adnate with a decurrent tooth (more rarely plano-adnate) rather distant, whitish, then pinkish salmon. Stem rather tall and slender, 4—5 cm × 2—$3^1/_2$ mm, slightly white-tomentose below; glabrous, brittle.

Spores somewhat ovate, obtusely wavy-angular, 9—10 × $6^1/_2$—7 μ.

Fig. spec.: (D. A. suppl. after pl. 373): Kirkeby, in great numbers in a wet bog, under Salix cinerea and solitary Betulas, Sept. 1936.

It is not unlike *R. speculus* and *R. nidorosus* but has longer spores, a more cartilaginous stem and an umbilicate cap.

CORTINARIUS.

(Conf. "Studies" X.)

C. sulphureus (Kauffm.) Lange. (*C. fulmineus* var. *sulphureus* Kauffm.).
In "*Studies*" X I referred this species to *C. elegantior*, but modern authors use this name for a species with larger spores. I do not follow Kauffman in attaching it to *C. fulmineus*. — *C. elegantior* var. *citrinus* is likewise altered to *C. sulphureus* var. *citrinus*.

C. croceo-coeruleus (Pers.) Fr.
In "*Studies*" X I described this species sub nom. *C. viola* Lange, rejecting the name *C. croceo-coeruleus*, because Fries and others ascribe lilac or violaceous gills to this species. But after having seen that Persoon himself nowhere mentions such coloration, I revert to the Persoonian name.

C. bivelus Fr.
Cap 6—8 cm, convex flat, soon expanded and slightly gibbous, smooth (minutely innato-fibrillose), fulvous tan, somewhat darker fulvous in the middle, not really hygrophanous, thin-fleshed (except

at umbo). Gills broad, broadly adnate (slightly emarginate), dark ferruginous, not crowded. Stem rather slender, inflated below (more or less), 7—10 cm × 10—13 mm (base 20 mm), lower part with a white coating, ending in a not very distinct annular zone, pale above with a veil coloured by the spores. — Flesh in cap white, in stem slightly tan-coloured. Smell faint; taste not bitter.

Spores ovate oval, $10^1/_2$—12 × 6—7 μ, contents granular, epispore slightly punctate-rough.

Fig. spec.: (D. A. suppl.): Grængerup (Fyn), in wood of old Fagus-trees, gregarious, Oct. 1937.

C. jubarinus Fr.

Cap 4—6 cm, at first somewhat campanulate, then expanded with a more or less prominent umbo, bay-brown (umbo darkest), paler towards the edge and minutely white-silky (when dry of a paler, glossy, cinnamon ferruginous hue). Gills at first pale tan-cinnamon, then shining cinnamon-fulvous, rather distant, somewhat adnate, edge somewhat eroded. Stem tall and slender (7—11 cm × 4—6 mm) glossy, silky, whitish, becoming somewhat brownish (on account of the ferruginous flesh). Veil very fugacious, not visible when the cap opens. Flesh without taste and smell.

Spores almond-shaped or ovate-ellipsoid, $7^1/_2$—8 × $4^1/_2$—5 μ; punctate rough.

Fig. spec.: (D. A. suppl.): Kirkeby, gregarious amongst rank mosses and Aira flexuosa, under Pinus, Oct. 1937. (Also in wood of Pinus at Tybrind, Oct. 1937.)

C. microspermus Lange n. sp.

Cap 4 cm, convex-flat, slightly gibbous, dry, of a vivid lion-yellow colour, somewhat fulvous in the middle, edge paler, faintly white-pruinate. Gills moderately crowded, broadly emarginate, rather broad, pallid then pale café au lait (with a pallid edge), at last ochry by the spores. Stem rather short (4 cm), somewhat swollen below and expanded immediately under the gills (base about 10 mm, 7 mm half way up), white, smooth, hollow with whitish flesh. Smell 0; taste slightly bitterish.

Spores oval, 5 × 3 μ, almost hyaline, smooth. Cystidia 0.

Fig. spec.: (D. A. suppl.): Gelsted, wood of Picea, Oct. 1937.

Probably *C. candellaris* Fr. var. *subcandellaris* Britz. is identical. Very well characterised by the small, pale spores. It has the colour and stature of *C.* (*Myxacium*) *vibratilis.*

PHOLIOTA.

(Conf. "Studies" IV.)

P. intermedia Lange.

Cap 5—8 cm, strongly convex, viscid, pale yellow but towards the middle almost completely covered by fulvo-ferruginous, broad,

triangular scales, which become more scattered towards the paler, almost straw-coloured edge. Gills pale yellowish, then cinnamon chestnut, emarginato-adnate. Stem 7—9 mm thick, squarrose — from base more than half way up — with recurved, ferruginous cinnamon scales on a slightly paler, brownish yellow ground, apex straw-yellow. Ring incomplete. — Almost inodorous.

Spores oval, 6—$6^3/_4 \times$ 4—$4^1/_2$ μ. Cystidia on edge of gills cylindric bottle-shaped, about 30×7 μ.

Fig. spec.: (D. A. suppl. after pl. 395): Krabbesholm, fasciculate in a knot-hole in trunk of Juglans 1932.

To this species belongs the find from Krabbesholm 1918, mentioned in "*Studies*" IV under *P. aurivella.* — My plant is intermediate between *P. aurivella* and *P. squarrosa*; the stem reminds one of *P. squarrosa*, the cap is more aurivelloid.

P. lucifera (Lasch.).

Cap $3^1/_2$—$6^1/_2$ cm, convex, slightly gibbous, dark yellow (disc somewhat ferruginous), viscid, with small, ferruginous fulvous, adpressed, droplike scales; edge fringed by the veil. Gills crowded, yellow, becoming ferruginous (edge paler), rather narrow. Stem 4—6 cm $\times$ 4—8 mm, fibrilloso-squamulose below the fugacious ring, apex yellowish white, rusty towards the base. Flesh somewhat bitter, yellowish white in the cap, rhubarb-rusty towards the base.

Spores oval phaseoliform, 7—$7^1/_2 \times$ 4—$4^1/_2$ μ, smooth, amber-yellow. Cystidia clavate basidiiform, about 8 μ broad.

Fig. spec.: (D. A. suppl. after pl. 393): Ermelunden at Charlottenlund, on buried twig (Fraxinus?), Oct. 1934 (M. P. Christiansen).

P. tuberculosa (Schaeff.).

Cap $2^1/_2$—3 cm, convex, yellow, centre rusty yellow, smooth at length disrupting towards the edge into small, adpressed squamules; edge incurved. Gills broadly adnate, rather crowded, yellow. Stem short, cinnamon ferruginous, with small, adpressed scales and a horizontal ring, apex whitish yellow, base slightly swollen, napiform. Taste somewhat bitter.

Spores ovate phaseoliform, $6^3/_4$—$7^3/_4 \times 4^1/_2$—5 μ, smooth, yellow. Cystidia balloon-shaped or inflated club-shaped, 20×8—14 μ.

Fig. spec.: (D. A. suppl. II after pl. 395): Herlufsholm, on fallen twigs in wood of Fagus, Aug. 1934 (M. P. Christiansen).

P. spectabilis var. *pusilla* Lange. (*P. junonia* Fr.).

Cap $2^1/_2$—$3^1/_2$ cm, convex or slightly gibbous, dark yellow to subfulvous, smooth, minutely innato-fibrillose, fleshy. Gills at first yellow, then ferruginous, somewhat decurrent. Stem about 5 cm $\times$ 4 mm, not hollow, almost glabrous, slightly inflated towards the base with a membranous, on the lower side somewhat brownish

ring, above the ring pale yellow, below fulvous-yellow (paler than the cap). — Subfasciculate.

Spores broadly almond-shaped, $8—8^1/_2 \times 5—5^1/_2 \mu$, minutely granulate-rough, dark yellow. Cystidia crowded, short, somewhat wavy, hairshaped, obtuse or subcapitate, 3μ broad above, 6μ below.

Fig. spec.: (D. A. suppl.): Højstrup, Odense, about 25 fructifications (some dwarfish) on a stump of a frondose tree (border of road), Sept. 1937 (Morten Lange).

Except for its pygmean stature this is in every way a true *P. spectabilis.*

P. heteroclita Fr.

Cap about 7 cm broad, convex, dry, light yellow, paler towards the edge, somewhat scaly in the middle by adpressed, brown scales; towards the edge less distinctly scaly, by dispersed, fibrillose squamules. Gills at first pallid, then watery-pallid grayish brown. Stem short, curved, base inflated, apex whitish, plumulose, below the rudimentary ring yellowish fibrillose, becoming rusty-rhubarb-coloured inside and outside towards the base. — Flesh very thick. Smell strong, reminding of *Inocybe pyriodora* and Armoracia. Spore-print light cigar-brown.

Spores oval-ovate or sub-phaseoliform, $7—8 \times 4^3/_4 \mu$, smooth, brownish yellow.

Fig. spec.: (D. A. suppl. after pl. 392): Virket Lyng (Falster), solitary on trunk of Alnus (F. H. Møller, Oct. 1933).

P. pumila Fr. var. *subferruginea* Møller & Lange.

Cap $1^1/_2$—2 cm, convex, edge indistinctly striate, honey-ferruginous (ochry when dry) very fragile. Gills very broad, broadly adnate (or slightly decurrent), of a vivid, ochry ferruginous colour. Stem about 4—5 cm, slightly paler than the cap, glabrous with an apical, small, membranous, substriate ring.

Spores ovate, $10 \times 6 \mu$. Cystidia about 60μ long, hair-shaped, obtuse, base slightly swollen ($6—7 \mu$ broad). Cuticle of fibrillose texture like *P. unicolor.*

Fig. spec.: (D. A. pl. 402): Skærnå-dalen, Borris, meadow-land, on wet ground amongst grass (not attached to moss), Sept. 1921.

The plant here described differs from the typical *P. pumila* (as described by Fries) by the membranous ring and the ochre-ferruginous gills.

P. præcox var. *paludosa.*

Sometimes described sub nom. *P. sphaleromorpha* (Bull.), but quite distinct from *P. s.* in the sense of Fries.

P. erebia forma *gracillima.*

A small and gracile type (cap only 3 cm broad).

Fig. spec.: (D. A. suppl. I after pl. 382): Åløkkeskov, Odense, on moist ground in frondose wood, Oct. 1935.

P. brunneola (Fr.) Lange. (*P. ombrophila* var. *brunneola* Fr.). Cap $4^1/_4$ cm, expanded, somewhat umbonate, coarsely wrinkled when old, dingy date-brown or grayish bistre (when dry paler date-brown). Gills rather narrow (4—5 mm) moderately crowded, with a paler, somewhat eroded edge, at first pallid grayish brown, then darker date-brown fuscous. Stem slightly clavate, 5—6 cm × 8 mm (base 10 mm), dingy whitish above, subfuscous below, hollow, somewhat rooting with coarse, white strands of mycelium. Ring pendulous. Spore-print cigar-brown.

Spores ovate to sub-limoniform, $7—8 \times 4^1/_2—4^3/_4$ μ, date-brownish, diaphanous. Basidia 4-spored. Cystidia very scarse, inflated, with or without a short, obtuse neck, averaging 45×18 μ.

Fig. spec.: (D. A. suppl. II after pl. 382): Frøslev, Flensborg, on sandy ground, open space in coniferous plantation, Oct. 1936 (solitary).

It may be nothing but a 4-spored form of *P. erebia*.

P. mycenoides Fr. (?).
The species thus designated in "*Studies*" IV I now call *Galera paludosa* (Fr.) Kühner.

INOCYBE.

(Conf. "Studies" III & V.)

I. corydalina Quél. var. *albido-pallens* Lange.
In "*Studies*" III I called this species *I. albidula* Bres. sensu Saccardo. But Britzelmayr's own description of *I. albidula* shows it to be an entirely different plant.

I. hæmacta B. & C.
Cap $2^1/_2—4^3/_4$ cm, convex flat, with a low umbo, at first grayish brown, tomentoso-squamulose with adpressed scales (edge somewhat fibrillose), then shaggy fibrillose by cigar-brown fibrils on a whitish ground, which at last becomes red. Gills pallid with a whitish edge, becoming grayish brown or (with age) flushed with red. Stem rather thin ($4—5^1/_2$ cm × 3—4 mm), slightly incrassated below, pallid, soon becoming flushed (from base up) with a greenish-gray colour, while the very minute fibrils and flocci are tinted a darker gray. The base remains white. The colour of the flesh of the stem is greenish, that of the cap becomes a deep and bright pink or almost cherry-red. Smell and taste almost 0.

Spores obliquely ovate or sub-limoniform, $9^1/_2 \times 6$ μ (or $8—10 \times 5^1/_2—6$ μ). Cystidia narrowly bottle-shaped, $65—95 \times 12—18$ μ. Paracystidia inflated clavate or almost ovate, 14—20 μ broad.

Fig. spec.: (D. A. suppl. after pl. 424): Tiselholt (Fyn), growing gregariously in wood of Fagus, in deep bed of dead foliage, Oct. 1935.

I. Langei Heim forma *major.*
This is the species which — with som doubt — I (in "*Studies*" III) described sub nom. *I. cæsariata* Fr. var. But *I. cæsariata* is now generally recognised as a relative of *I. dulcamara.* — My plant is somewhat larger than described by HEIM.

I. Langei forma *bispora* Lange.
Cap $2^1/_4$—3 cm, convex, at last expanded and subumbonate, at first almost glabrous, fibrillose, at last disrupting irregularly, thus becoming rimoso-squamulose. Cuticle brownish ochre with a flush of pale yellow. Gills at first pallid, becoming grayish brown, attenuated behind, adnexed. Stem cylindrical, base whitish, minutely striolate and pruinose above (cystidia!) and gradually flushed with the colour of the cap. Odour faint, sub-spermatic.

Spores $10^1/_2$—$12 \times 5^3/_4$—$6^1/_4\,\mu$, somewhat oblique with a distinct pedicel. Basidia about $7^1/_2\,\mu$ broad with two sterigmate. Cystidia rather short (50—55) and thick-necked bottle-shaped, thick-walled, about 13—15 μ broad.

Fig. spec.: (D. A. suppl.): Gelskov (Fyn), in a moist ditch, road through wood of Fagus, Sambucus etc., Oct. 1937.

I. eutheles var. *Quéletii* sensu Heim. (but not *I. Quéletii* Maire & Konr.) seems to be almost identical; but nothing is known about the number of sterigmata in this form.

I. serotina Peck. (*I. ammophila* Atks.).
Cap $2^1/_2$—5 cm, convex, subumbonate, becoming somewhat gibbous, alutaceous whitish in the middle, somewhat ochry clay-colour at the circumference, almost glabrous, except towards the edge, where it is fibrillose (and generally densely sprinkled with adhering grains of sand). Gills pale grayish brown, then darker cigar-brown, edge paler. Stem stout, 4—6 cm $\times$ 5—12 mm, cylindric (base slightly incrassated), almost glabrous, whitish, generally more than half way immersed in the sand. Flesh rather thick, almost inodorous.

Spores large, generally obliquely cylindric ellipsoid (12) $13^1/_2$—15 (17) $\times\ 5^1/_2$—$7\,\mu$. Cystidia inflated, obovate or vesiculose-pyriform, obtuse, large (45—55 $\times$ 18—24 (30) μ, occasionally somewhat crested, but more often without cristals.

Fig. spec.: (D. A. suppl. after pl. 408): Blåvand, outer sand-dunes, Oct. 1935 (leg. MORTEN LANGE).

This characteristic species was originally described from N. America but has recently been met with in Holland. It probably grows all along the sand-dune region.

I. Patouillardii Bres. (*I. lateraria* Rick.).
Cap 5—$6^1/_2$ cm, campanulate, then convex and somewhat umbonate, often somewhat split with age. Surface minutely silky when young (disc glabrous), whitish, becoming flushed with brownish

ochre and bright pinkish flesh-colour when touched. Gills whitish, then clay-grayish. Stem rather stout (about 7 cm × 11 mm), slightly incrassated, almost glabrous, whitish, turning pinkish when bruised. Smell rather rankish, strong,

Spores ovate-ellipsoid, $9^1/_2$—$11 \times 5^1/_2$—$6\,\mu$. Cystidia clavate, occasionally sub-capitate, 60—70 × 7—15 μ.

Fig, spec.: (D. A. suppl. after pl. 432): Alindelille (Sjælland), in mixed, frondose wood, June 1930 (leg. F. H. Møller).

I. maculata Boud.

Also the specimens entirely devoid of scales — which I (in "*Studies*" III) referred to *I. brunnea* — are now generally called *I. maculata*, the name *I. brunnea* being reserved for a species with crested cystidia.

I. dulcamara (Pers.) Fr. (*I. delecta* Karst.).

In "*Studies*" III I used the name *I. delecta* which so far is a better name than *I. dulcamara*, as the plant is almost tasteless. But the older name is now generally applied to this species.

I. xanthomelas Bours. & Kühner.

The description of this species shows it to be identical with the form which I (in "*Studies*" III) called *I. prætervisa* var. *pusilla*.

I. margaritispora (Berk.) Lange.

Cap 4—$5^1/_4$ cm, convex expanded with an obtuse umbo, light crust-brown or somewhat ochry, disrupting up to the umbo into minute, adpressed, somewhat imbricate squamules which towards the edge become very small and fibrillose, dispersed on the whitish ground. Gills narrow, first pallid, then grayish to brownish. Stem rather stiff upright with a slightly flattened but not distinctly marginate bulb, becoming slightly isabella, sub lente minutely pruinate, especially above.

Spores $7^1/_2$—9×7—$7^1/_2\,\mu$, stellate or somewhat oblique and irregular, outline with about 6 obtuse, but prominent, coarse nodules (when seen from above always stellate with 5(6) processes). Cystidia (on edge and faces of gill) crested, rather broad-necked and obtuse, 55—65 × 10—15 μ (neck about 7—8 μ).

Fig. spec.: (D. A. suppl.): "Slukefter" (near Odense) in wood, on humous ground under Corylus, Aug. 1937.

Differs from the very closely related *I. prætervisa* by the scaly cap and the non-marginate bulb. The spores are considerably shorter. According to Heim (in lit.) Berkeley's type has spores and cystidia exactly like mine.

I. Boltonii Heim.

I have adopted this name for the species which in "*Studies*" III I, with some doubt, referred to *I. plumosa* Quél. (nec Bolt.).

I. trechispora Berk.
Cap 1.3—1.5 cm, conic convex, then expanded and umbonate, slightly viscid, ivory-white, becoming straw-yellow or very pale ochre (umbo concolorous), silky, then fibrillose and subrimose. Gills rather narrow, pale when young. Stem thin, often somewhat wavy (3—4 cm × 2 mm), white, at last slightly yellowish, minutely powdered, base slightly incrassated with radiating mycelioid hairs. Smell slight.

Spores small, wavy nodulose, $7^1/_2$—$8 \times 4^1/_2$—$4^3/_4\,\mu$, outline with 5—6 somewhat prominent, obtuse nodules. Cystidia fusoid, 45—60 × 9—13 μ, crested.

Fig. spec.: (D. A. suppl. after pl. 452): Langesø (Fyn), in boggy places in wood, especially under Betula and Salix cinerea, Oct. 1930.

I. lanuginosa (Bull.).
The figured form of this species represents what Velenowsky calls var. *Casimiri* (*I. lanuginosa* sensu Bresadola).

FLAMMULA.

(Conf. "Studies" VII.)

F. spumosa Fr.
Cap 3—$4^1/_2$ cm, convex flat, light yellow (centre flushed with fulvous brown) with a slimy coating. Young gills pale yellow. Stem slightly silky-fibrillose (veil evident), somewhat hollow, yellow, towards the base tinged olive-brownish. Flesh yellow, dusky olivaceous in lower half of stem.

Spores ovate ellipsoid, $7^1/_2 \times 4^1/_2\,\mu$. Cystidia (on edge and faces of gills) somewhat inflated fusiform, obtuse, 35—40 × 12 μ, contents often yellowish.

Fig. spec.: (D. A. suppl. after pl. 466): Örkelljunga (Sverige), Aug. 1928, on sawdust in open space. Also on record from Frøslev plantage, (Sønderjylland), on sawdust, Oct. 1936 (leg. Morten Lange).

F. hybrida Fr.
Cap 3—$6^1/_2$ cm, convex, indistinctly umbonate, almost even (slightly innato-fibrillose) at first light yellow (centre subfulvous), then vivid ferruginous, hygrophanous. Gills crowded, light yellow, fulvescent, not spotted with ferruginous spots, broad and broadly adnate, either sub-decurrent or slightly emarginate. Stem comparatively short and thin (4—7 mm broad), light ochry yellow when young, becoming dusky ferruginous from base up; apex whitish yellow with a faint, fibrillose, annular zone, base white-tomentose. Taste bitter.

Spores ovate, $6^3/_4$—$7^1/_2 \times 4$—$4^1/_4\,\mu$. Cystidia short, hair-shaped, apex sub-capitate, 25—35 × 3 μ, head 4—5 μ.

Fig. spec.: (D. A. suppl. II after pl. 470): Åløkkeskov, in a plantation of Abies alba on stumps, needles and chips, Oct. 1934 (Morten Lange).

F. inaurata W. G. Sm.
Cap $1^1/_2$—4 cm (mostly about 3 cm), at first convex, then depressed, edge somewhat wavy, when young light ochre, but soon becoming vivid and deep yellow, smooth, sub lente minutely innato-fibrillose and silky, slightly viscid. Veil whitish-yellow, membranous fibrillose. Gills rather large, moderately crowded, slightly emarginate with a decurrent tooth, at first yellowish white, then yellowish cinnamon or almost ferruginous. Stem wavy, rather short (3—4 cm), 2—$2^1/_2$ mm broad (slightly broader above), yellowish white and minutely pruinate at apex, yellowish brown and silky fibrillose below. Flesh rather thick. Spore-powder clay-cinnamon. Taste and smell faint.

Spores oblong ovate or sub-phaseoliform, $7 \times 3^1/_2 \mu$, smooth, almost hyaline. Cystidia hair-shaped clavate, about $5^1/_2 \mu$ broad (some few clavate ovate ones broader, 30—$35 \times 11 \mu$).

Fig. spec.: (D. A. suppl. I after pl. 470): Elsehoved (Fyn), in grass under solitary Salix cuspidata, on meadow-land, a small circle, Oct. 1935.

F. flava (Bres.) Lange. (*Naucoria flava* Bres.).
The name *Flammula dactylidicōla* Lange has to be cancelled, as Bresadola's figure in "*Iconographia*" of *Naucoria flava* (which is older) evidently depicts the same species. But the plant is better retained in *Flammula*.

PSALLIOTA.

(Conf. "Studies" VI.)

P. silvicola (Vitt.).
Cap 6—12 cm, convex expanding, cream-white, almost smooth. Gills white then slightly flushed with pale flesh-colour. Outer ring often rudimentary. Stem rather slender, white, smooth, generally swelled at the base to an oblique, somewhat depressed bulb. The skin of all parts turns rapidly yellow to the touch, the flesh of the stem becomes dusky to blackish with age, from apex downward. Odour very pronounced.

Spores ovate ellipsoid, 6—$7 \times 3^3/_4$—4μ. Basidia 4-spored.

Fig. spec.: (D. A. suppl. after pl. 639): Langesø, in wood of Picea, Oct. 1932.

Common in woods of Picea, more rarely and often solitary in frondose woods. *P. abrubtibulba* Peck evidently is identic. Ricken reserves the name *P. arvensis* for it, naming P. arvensis *P. cretacea*, a rather unhappy choice of names.

P. subfloccosa Lange (nom. provis.).
In "*Studies*" VI I described this characteristic mushroom as a variety of *P. hortensis*; but the double ring and the 4-spored basidia point in the direction of *P. Rodmanii*, and I think it deceryes specific rank. It is also on record from Sweden (LUNDELL).

P. hortensis forma *avellanea*.
The cultivated brownish mushroom, in Denmark raised from pure cultures of American origin, but not notably differing from the wild *P. hortensis*.

Fig. spec.: (D. A. suppl. after pl. 646): Trolleborg, Apr. 1936, in greenhouse.

P. hortensis forma *albida*.
The cultivated white mushroom, likewise raised from pure cultures. It only differs in being almost glabrous, devoid of the hazel-brown, fibrillose coating. Booth forms are constantly 2-spored.

Fig. spec.: (D. A. suppl. after pl. 645): Trolleborg, Apr. 1936, in greenhouse.

Innumerable varietal names have been invented for these and other similar cultivated forms.

P. subperonata Lange.
In "*Studies*" VI I regarded this form as a variety of the collective species *P. hortensis*. It appears to be distinct from *P. Rodmanii* which is almost smooth.

P. Rodmanii Peck (*P. bitorquis* Quél.)
Cap 5—10 cm, compact, plano-convex, slightly depressed, edge broadly involute, whitish, slightly ochry with age, almost smooth. Gills dingy pink, edge pallid. Ring double, the lower one more or less distant or even almost basal, thus forming a spurious volva. Stem whitish, stout and firm (2—3 cm thick), its flesh slightly rubescent.

Spores roundish ovate, $5^1/_2$—$6 \times 4^1/_4$—$4^1/_2 \mu$. Marginal cystidia clavate, about 30×6—7μ. Basidia 4-spored.

Fig. spec. (D. A. suppl. after 645): Odense, naked soil, along a pier, June 1938. Not uncommon in villa-gardens, park-drives, on naked, rich soil, sometimes in clusters. *P. campestris* var. *edulis* Vitt. and *P. c.* var. *alba* Bres., to judge from the figures, must belong here.

P. brunneola Lange (nom. provisor.).
Cap $5^1/_2$—7 cm convex, rather thick-fleshed, everywhere densely covered by innate, minute fibrils and fibrillose squamules of a dull brownish crimson or purplish-brown colour, edge pallid. Gills somewhat distant, white when young, then pale chocolate with a slight

tinge of lilac. Stem white, glabrous, rather short and somewhat conical, subbulbous, slightly rhubarb-yellow to the touch (like the cap), with a thin, white ring, the edge of which is slightly thicker. Flesh white, becoming somewhat rhubarb-yellowish with age from base up. Odour rather pronounced.

Spores ovate, $4^1/_4$—$5 \times 3^1/_2\,\mu$, diaphanous, rather pallid. Cystidia on gill-edge obovate, rather large, 10—18 μ broad. Basidia 4-spored.

Fig. spec.: (D. A. suppl. after pl. 648): Nyborg, in wood of Fagus, on boggy ground (black humus), July 1929 (leg. Morten Lange).

This species differs from *P. rubella* by the more fleshy and more densely fibrillose cap and the lack of any flesh-colour in the gills. *P. fulveolus* (Lasch) Fr. is probably identical. *P. arvensis* var. *purpurascens* Cooke is evidently a near relative of *P. brunneola* (and not of *P. arvensis* which has larger spores). All these forms should be further studied.

STROPHARIA.

(Conf. "Studies" V & XI.)

S. spintrigera Fr.

Cap about 4 cm, strongly convex, somewhat fleshy, dark date-brown, becoming distinctly striolate and dusky at the edge, alutaceous with a flush of fulvous at the disc when dry. Veil thick, cottony, mostly appendiculate, snow-white, sulcate. Gills broad, at first pallid lilaceous-gray, then darker grayish brown, edge whitish. Stem rather tall (6—7 cm $\times$ 5—6 mm), white, hollow, somewhat flocculose below, striate above the ring-mark.

Spores ovate, sub-phaseoliform, 6—$7^1/_2 \times 4^3/_4\,\mu$. Cystidia a: vesiculose, obovate or balloon-shaped, 10—14 μ broad; b: somewhat bottle-shaped, 40—50 $\times$ 12—15 μ.

Fig. spec.: (D. A. suppl. after pl. 667): Gisselfeldt, in frondose wood with dispersed Abies alba, gregarious on the ground amongst needles, Oct. 1929. — A somewhat fasciculate form found in another locality on old stump of Fagus.

S. hypsipoda Fr.

Cap 6—7 cm, soon becoming flat or even somewhat depressed, thin, whitish, slightly alutaceous or horn-brownish in the centre, minutely radiato-lineate (sub lente). Gills ventricose, bistre to sepia, edge whitish, somewhat adnate, but easily detached. Stem tall, straight, hollow, 9—11 cm $\times$ 10—15 mm, white, apex striate, base slightly flocculose; ring pendulous, thin, about 4 cm from apex. Spore-print almost black.

Spores broadly oval, $9 \times 5^1/_2\,\mu$, coffee-brown, slightly translucent. Cystidia about $32 \times 12\,\mu$, short-necked bottle-shaped or subfusiform. The cuticle of the cap is parenchymatic, its individual cells oval-subspheric or polyhedric, 25—50 μ diam.

Fig. spec.: (D. A. suppl. after pl. 668): Hesselagergård, a small fascicle in ditch, under old trees (Quercus, Fraxinus, Cratægus), Oct. 1935.

LACRYMARIA.

(Conf. "Studies" V.)

Lacrymaria is better treated as a distinct genus than as a subgenus under *Hypholoma*, as done in "*Studies*" V.

HYPHOLOMA.

(Conf. "Studies" V.)

H. chondrodermum (B. & Br.) Lange. (*Psilocybe chondroderma* B. & Br.).

I described this species in "*Studies*" V sub nom. *H. instratum* Cke. The distinct, white veil shows its right position to be in *Hypholoma*.

PSILOCYBE.

(Conf. "Studies" XI.)

P. (*Deconica*) **bullacea** (Bull.).

Cap about 1.8 cm, semiglobate to strongly convex, rufous bistre, edge striate. Gills very broad, horizontal, plano-adnate with a decurrent denticle, fuscous. Stem short (2 cm), $1^1/_2$—$2^1/_2$ mm broad, whitish above, dirty brownish below (whitish inside).

Spores ellipsoid-ovate, $8—10 \times 4^1/_2—5\,\mu$.

Fig. spec.: (D. A. pl. 698): Skørping, solitary in young plantation of Picea (open space, sandy soil), 1897.

A dubious record. But my plant answers so well to the figure and description given by Bresadola (*Iconographia*, tab. 804) that I attach his name to it.

PSATHYRA.

(Conf. "Studies" XI.)

P. obtusata var. *vernalis* Lange.

Differing from the main form in having a more expanded cap which — when fully opened — is shining and slightly viscid, when dry not micaceous. This is due to the fact that the epidermal, globate cells dissolve at an early stage.

There are no bottle-shaped cystidia on the gill-edge, only balloon-shaped ones. The epidermal cells on the young cap have a diameter of $18—30\,\mu$.

Fig. spec.: (D. A. supplem.): Åløkkeskov, on somewhat boggy ground under Fraxinus, gregarious on the ground (black humus), May 1937.

Although this form has a rather different habit I do not think it deserves specific rank.

P. coprobia Lange.

The name *P. semivestita* var. *coprobia* Lange had better be replaced by *P. coprobia*.

COPRINELLUS.

(Conf. "Studies" II.)

C. (*Psathyrella*) **disseminata** and **C.** (*Psathyrella*) **impatiens**

which are intermediate between *Psathyrella* and *Coprinus*, are better set apart in a distinct genus (as done by Quélet). It is not improbable that other species also will find their place here.

The species differ from the true *Coprini* in having non-diffluent gills, from the genuine *Psathyrellas* in having a more or less radiato-sulcate cap (with minute, erect bristles), and larger sterile cells ("paraphyses") surrounding the fertile basidia as in *Coprinus* (although not quite so differentiated and vesiculose).

Such *Coprini* as *C. tardus* and *C. plicatilis* are intermediate.

COPRINUS.

(Conf. "Studies" II.)

C. comatus Schum. forma *sphærocephala*.

Cap originally almost globose, 5—6 cm diam., unusually coarsely scaly. Stem short. For the rest like the main form.

Fig. spec.: (D. A. suppl. after pl. 732): Husmandsskolen (Odense), in park, naked ground under shrubs, Oct. 1928 (observed three consecutive years in the same place).

C. macrocephalus Berk.

The plant described in "*Studies*" II as "*C. fimetarius* var." answers so well to the description of *C. macrocephala* and Cooke's figure ("*Illustrations*" pl. 682A), that I feel justified in attaching this name to it. The smaller dimensions, the rootless stem and the longer spores distinguish it from *C. fimetarius.* — It grows on rotten hay, bran and other vegetable matter.

C. cordisporus Gibbs.

Josserand (Ann. Soc. Lin. Lyon (1933)) regards *C. cordisporus* as a synonym for *C. Patouillardii* Quél.; but this latter is twice or thrice as large, with a "flavo-ferruginous" cap, so my specimens at least seem to be distinct from it.

C. tardus Karst.

The spores of this species are not entirely glabrous but somewhat rough. It is evidently the same species as Ricken calls *C. tergiversans* (although he depicts the spores exaggeratedly with coarse and prominent warts). But Fries' description of *C. tergiversans* is very divergent. ("Pileo rimose squamulosoque, e conico expanso").

C. hiascens (Fr.) Lange. (*Psathyrella hiascens* Fr.).
Cap mostly 0.7—1.2 cm high, ovate, then campanulate and somewhat expanded but never with recurved edge, becoming fissosulcate from edge to umbo. Colour at first pallid alutaceous (umbo slightly fulvous), then gray, transversely rugulose between the grooves, edge somewhat irregularly crenate. Gills adnexed, at first concolorous, then gray (edge blackened by the spores), marcescent and at last somewhat diffluent. Stem about 6 cm high, subdiaphanous, at first minutely plumulose, very brittle. — Somewhat fasciculate.

Spores lanceolate ellipsoid, $9^1/_2$—$10 \times 4^1/_2$—$5\,\mu$, opaque, blackish umber. Cystidia at the gill-edge very numerous, somewhat bottle-shaped, 30—$50 \times 12\,\mu$, with a longer or shorter neek. Cuticle of cap made up of roundish cells (25—30 μ diam.) and solitary, upright bristles ($150 \times 6\,\mu$). On the young stem are somewhat similar hairs.

Fig. spec.: (D. A. suppl. after pl. 762): Åløkkeskov, densely gregarious and sub-fasciculate amongst grass in open space in wood of Fagus, Oct. 1928.

I refer this species with some doubt to *Agaricus hiascens* Fr. It has very much in common with *Coprinellus disseminatus* and also bears some likeness to *Coprinus ephemerus*. It might be referred to *Coprinellus* if the gills were not somewhat diffluent (although tardily).

C. hæmerobius Fr.
I referred this species with some doubt to *C. sociatus* Fr. in "*Studies*" II. But it is evidently the plant described by Bresadola sub nom. *C. hæmerobius* Fr. ("*Iconographia*", tab. 886), and the name *C. sociatus* is at least inappropriate for a species which always grows solitarily. It is a much more slender and less tough species than *C. Hansenii*. Both have marcescent, hardly diffluent gills.

C. Hansenii Lange.
Coprinus crenatus sensu Ricken evidently is identical, but the original *Agaricus crenatus* (Lasch) Fr. — which Fries placed in *Psathyrella* — is something else. Bresadola calls it *Psathyrella hydrophora* (Bull.); but Ricken's *P. hydrophora* is an entirely different plant. I therefore deem it preferable to uphold my name.

It must be a subject for further investigations to elucidate the right boundary-line between *Coprinus* and *Coprinellus*.

LIMACIUM.

(Conf. "Studies" V.)

L. aureum (Arrh.) Fr.
Cap about 3 cm broad, somewhat depressed, golden orange, centre almost vermillon, somewhat slimy. Gills thin and somewhat

crowded, decurrent with a tooth, pale yellow. Stem about 4 cm × 7 mm, rather slender, glabrous, yellowish white, slightly brownish downward (base pallid). The slimy annular zone not distinctly visible (in old specimens). Flesh under the cuticle yellowish (in cap and stem).

Spores variable in size and shape (9 × 4, 7 × 4$^1/_2$ μ), mostly somewhat pip-shaped or ellipsoid.

Fig. spec.: (D. A. suppl. after pl. 774): "Marielyst" (Falster), on humous ground in wood of Pinus (F. H. Møller, Nov. 1936).

L. Bresadolæ Quél. is probably synonymous. *L. speciosum* Peck sensu Bresadola also seems to be identical, but not his *L. aureum*. *L. speciosum* in the sense of Kauffman is a much more robust species.

L. lucorum (Kalchbr.).

Cap convex, egg-yellow, very slimy, about 4 cm broad. Gills pale yellowish cream, decurrent. Stem 5—6 cm × 5—7 mm, whitish with a flush of yellowish, especially in the middle, glabrous, slightly hollow.

Spores cylindric ovate, 7$^1/_2$—9 × 4$^1/_4$—4$^1/_2$ μ.

Fig. spec.: (D. A. suppl. after pl. 781): Ashøj Overdrev, Nov. 1933, under Larix (leg. M. P. Christiansen).

L. pudorinum Fr.

Cap 7—10 cm, expanded, slightly gibbous, edge strongly incurved, viscid, glabrous, pale ochry flesh-colour, disc slightly pinkish, edge paler. Gills somewhat distant, rather thick, arcuate and somewhat decurrent, whitish with a faint flush of the colour of the cap. Stem white, tinged with the same colour below, slightly plumulose above, 6—7 cm × 15—20 mm. Flesh compact, white, almost tasteless.

Spores roundish ovate, 6$^1/_2$—7$^1/_2$ × 5$^1/_2$—6 μ.

Fig. spec.: (D. A. suppl. after pl. 780): Haderslev, open frondose wood, Sept. 1934 (Poul Larsen).

L. penarium Fr.

Some authors refer this species to *Camarophyllus*. But an examination of the gill-trama shows this to be erroneous, as the central part of the trama is formed of straight, sub-cylindrical, almost parallel hyphæ (up to 15 μ broad) which towards the outside become divergent and thinner.

CAMAROPHYLLUS.

(Conf. "Studies" V.)

C. pratensis (Pers.).

A new figure is added on my plate in 1930, depicting a larger specimen from grassy hillock at Langesø, Oct. 1930.

C. lacmus Schum.

Cap 2—$2^3/_4$ cm, convex, at last somewhat gibbous with upturned edge, brownish gray with a faint flush of crimson-lilac, pellucido-striate (when dry pallid with a tinge of pinkish flesh-colour). Gills thick distant, venose, decurrent, gray. Stem 3—4 cm $\times$ 3—5 mm, pale gray above, tinged more or less yellowish below. Flesh rather firm and dry with a slight bitterish aftertaste.

Spores almost spherical, $6 \times 5\,\mu$.

Fig. spec.: (D. A. suppl. after pl. 789): Næsby (Fyn), grassy slopes towards a rivulet, Oct. 1932.

Velenowsky has described this species sub nom. *C. globisporus.*

C. atropunctus (Bres.) Lange.

Cap 1—$1^1/_2$ cm, convex, edge incurved, hygrophanous, bister, darker in the middle, edge paler, comparatively fleshy. The surface of the cap is slightly velutinous-pruinate (when dry paler, dusty). Gills distant (16—20 entire and as many short ones), plano-arcuate and adnato-decurrent, thick, pale brownish, somewhat powdery, at last dark grayish brown and white-pruinate. Stem concolorous with the cap. 2—$3^1/_2$ cm $\times$ 2 mm, paler above, somewhat wavy, upper half with dispersed, minute, granular flocci of a blackish colour. Veil 0. Smell and taste absent.

Spores ovate-spheric, $5 \times 4\,\mu$, glabrous, contents granulate. Cystidia 0. Basidia narrow club-shaped, about $5\,\mu$ broad. Cuticle of cap formed of balloon-shaped or globate, 18—$30\,\mu$ broad cells. The mediostratum of the gills and the flesh of the cap are formed of hyaline, interwoven, 3—$5\,\mu$ broad hyphæ. The squamules on the stem are made up of wavy, septate hyphæ with subfuscous contents.

Fig. spec.: (D. A. suppl. after pl. 788): Åløkkeskov, gregarious on the ground under young Fraxinus in wood of Fagus, Sept. 1934 (and later years) (leg. Morten Lange).

This peculiar little species is described very well by Bresadola who places it in *Omphalia.* But it finds a more natural position in *Camarophyllus* on account of the very thick gills. Fries' *Agaricus atropunctus* is a dubious species, which he places in *Eccilia.* Also Ricken's species is somewhat dubious.

HYGROCYBE.

(Conf. "Studies" V.)

H. mucronella Fr.

Cap about 1 cm broad and high, parabolic campanulate, orange scarlet, expallent. Gills extraordinarily broad, edge almost horizontal with a decurrent tooth, yellow with a flush of orange. Stem thin and slender ($4^1/_2$ cm $\times$ 2 mm), orange, more yellowish above

and white towards the base. Flesh yellowish, bitter. Both the cap and the stem are viscid.

Spores oblong ovate, $8 \times 4^3/_4\,\mu$. Basidia 4-spored.

Fig. spec.: (D. A. suppl. after pl. 810): Langesø, solitary in grass on hill-slope in open wood, Oct. 1930 (and 1931).

The bitter taste makes it highly probable that it should be regarded as a form of *H. Reai*. But its habit is very distinct.

LACTARIUS.

(Conf. "Studies" VII.)

L. resimus Fr.

Cap 12—15 cm, convex expanded, profoundly infundibuliform in the middle, towards the edge slightly grooved or veined, whitish, becoming somewhat yellowish, surface viscid, the strongly incurved edge at first minutely downy-felty. Gills rather narrow, decurrent, whitish, becoming light flesh-colour ochry, fairly crowded (not so crowded as in *L. controversus*). The latex rather quickly turns sulphur, and so does the flesh immediately over the gills. Stem short and thick (3×2.5 cm) white, slightly downy, hollow. Taste somewhat bitterish pungent, not very pronounced.

Spores broadly oval or subspheric, minutely and densely verrucose, $7—8^1/_2 \times 6^1/_2—7\,\mu$.

Fig. spec.: (D. A. supplem. after pl. 820): Sandflugtsskoven v. Rønne, Sept. 1937 (leg. ARNE LARSEN).

L. uvidus Fr.

Cap 4—7 cm, plano-convex, becoming somewhat depressed with an almost obsolete umbo, pallid livid-gray with a flush of lilaceous, edge at first faintly white-pruinate, surface slimy. Gills crowded, thin, cream-white, becoming pale isabella. Stem rather thin, livid whitish, becoming flushed and stained with yellowish from base up. Gills, stem and cuticle turn lilac-lavender to the touch; isolated drops of the latex do not turn. Flesh almost tasteless, with a somewhat bitter after-taste.

Spores roundish oval, $8^3/_4—6^2/_3\,\mu$ (exclusive the spinules), spinulose and slightly reticulate (sub immers.).

Fig. spec.: (D. A. suppl. after pl. 830): Morud, in a bog under Betula and Rhamnus, Oct. 1928, gregarious.

It has the colour of young specimens of *L. vietus*, but for the rest it is very like *L. flavidus*. GILLET's figure of *L. uvidus* gives a good representation of my plant.

L. paludinellus Peck.

The plant which I — with some doubt — referred to this species, differs considerably from the American form, so the name had better be cancelled.

L. torminosus (Schaeff.) var. *gracillimus* Lange.
Cap 4—6 cm, white, at last somewhat yellowish. Stem slender, hollow and brittle.

Fig. spec.: (D. A. suppl. after pl. 819): Morud, solitary under Betula and Rhamnus, on boggy ground, Oct. 1928.

Differing from the main form by the small, whitish cap and the slender stem, from *L. pubescens* (as described in literature) by the plushy-tomentose edge and the slender stem. — *L. scoticus* Cooke may be identical.

L. subdulcis (Bull.)
The typical form is figured in D. A. on the supplementary plate after 849. It was collected in a wood of Fagus, Søby-Søgård, Oct. 1932. Fig. 850 is dubious.

RUSSULA.

(Conf. "Studies" VI.)

R. expallens Gill.
R. Queletii var. *fusco-rubra* and var. *atropurpurea* in Bresadola's "*Iconographia*" evidently are identical with this species.

R. livescens (Batsch.) Bat.
Bresadola depicts this species sub nom. *R. pectinata.* The spore-print on white ground is cream-yellow (paler than b 8).

R. livescens var. *depauperata*
is figured by Bresadola in "*Iconographia*" as *R. livescens.*

R. simillima Peck
J. Schaeffer ("*Russula-Monographie*") prefers the name *R. farinipes* Rom. apud Britz. for this species.

R. ochroleuca (Pers.).
The cuticle of the cap is formed of 3 μ broad, yellow to hyaline hyphæ; no cystidia.

R. violeipes Quél.
The spore-powder is cream-white (paler than g 5) when seen on a white ground, white when gathered on black paper.

All the forms including *R. amoena* Quél., and *R. citrina* Quél. (nec Gill.) are by some modern authors included in *R. Mariæ* Peck.

R. azurea Bres. (sensu J. Schaeff.).
Cap 4—6 cm, convex, becoming depressed, slightly pruinate, of different colours (pigeon-blue, flesh-colour lilaceous, olive-greenish,

generally becoming pallid greenish; edge at first even, then slightly striate. Gills very crowded, rather narrow, cream-white. Stem cylindric, white, even.

Spore-powder pure white.

Fig. spec.: (D. A. suppl. after pl. 865): Kirkeby, old wood of Picea, Sept. 1926.

Differing from *R. parazurea* by more motley colours, more slender stem and less visible pruinosity.

R. parazurea J. Schaeff.

This is what in "*Studies*" VI I called *R. azurea*, a species constantly found in deciduous woods, while *R. azurea* proper is pinophilous. But the two are very similar. In *R. parazurea* the spore-powder, when gathered on white paper, is cream-yellowish (b 7 + b 8).

R. olivascens Fr. (sensu Lange)

is now by most authors referred to *R. grisea* Secr. The proofs, however, are not absolutely convincing.

R. vinosa Quél.

The spore-powder in my species is pure white, and for this reason my plant can hardly be Quélet's species but should be transferred to the neighbourhood of *R. atropurpurea.*

R. sanguinea var. *rosacea.* (*R. rosacea* sensu Bres.).

Somewhat larger than the main form, more robust, with somewhat chagrinated cuticle. The colour is less scarlet, soon decolorating to whitish.

Spore-powder cream, on white paper yellowish cream.

Fig. spec.: (D. A. suppl. after pl. 896): Langesø, gregarious under old Pinus-trees, Oct. 1932 (and later years).

R. rubicunda sensu Singer seems to be identical.

R. cyanoxantha forma *atroviolacea.*

Differing from the more common forms by the dark violaceous-purple colour. The stem is slightly flushed with pink. The gills (which are often bifurcate) are slightly yellowish, but the spore-powder is white.

Fig. spec.: (D. A. suppl. after pl. 883): Åløkkeskov, wood of Fagus, Sept. 1934.

R. paludosa (sensu J. Schaeffer).

Cap 8—10 cm convex, of a deep and rich crimson blood-red, not expallent, somewhat shining, slightly grooved at the edge when old. Gills at first white, then cream-yellowish, broad and rotundate in front, slightly emarginate behind, edge often red towards the brim of the cap. Stem white, more or less flushed with bright pink.

Flesh almost tasteless (slightly acrid when young), with age sometimes attaining a fruity honey-odour. Spore-print cream-yellowish (b 8, with a little of i 2).

Cuticle formed of thin, red hyphæ (3 μ broad). Cystidia lacking, only some few 4 μ broad, slightly clavate, elongated pseudocystidia are to be seen.

Fig. spec.: (D. A. suppl. after pl. 911): Gerup Skov (Holstenshus), in a bog with various trees (Pinus, Betula etc.), growing in Sphagnum, Aug. 1933 (and later years).

The mild flesh and the yellowish spore-powder distinguish this species from large forms of *R. emetica* which grows in the same localities. The constantly white flesh separates it from *R. melliolens* and *R. purpurea* Gill. (= *R. xerampelina* auct.). *R. purpurascens* Bres. seems to be almost identical.

R. purpurea Gill.

Most modern authors use the name *R. xerampelina* (Schaeff.) Fr. for this species and its allies. I think the various herring-smelling species with discolouring flesh are better kept apart, with distinctive names. *R. purpurea* is the deep and dark red, pinophilous form (*R. xerampelina* var. *rubra* of Singer).

R. graveolens Rom.

This species, the more or less olivaceous form from frondose woods (Fagus), is *R. xerampelina* var. *Barlae* apud Jul. Schaeffer.

R. graveolens var. *subrubens* Lange.

Cap 5—7 cm, convex flat, then deeply depressed, red-brown with a flush of purple, edge even, then somewhat grooved, centre darker, but more or less expallent, in spots, to pallid ochry. Cuticle detachable. Gills mostly entire (some few dichotomous and shorter ones), cream-white, then custard-yellowish. Stem rather thick, venose, flushed more or less with pink from base upward. Taste slightly bitter. Spore-powder (on a white ground) light ochry custard-colour, on black paper pale custard-coloured. For the rest like the main species.

Fig. spec.: (D. A. suppl. after pl. 905): Elsehoved (Fyn), in Alnus-Fraxinus copse on marshy ground, at the edge of a Phragmites-belt, Oct. 1935 (a number of specimens).

R. melliolens Quél. (sensu Jul. Schaeffer).

Cap 8—9 cm, dark brown-red (d 1—n 1), towards the edge paler, incarnate brownish, at last coarsely striate, glabrous and somewhat shining. Gills rather broad, becoming tan-yellowish. Stem white, with age and in fissures and wounds becoming brownish tan like the flesh of the cap. Smell (of the mature or over-ripe specimens)

somewhat pungent sweetish (honey). Spore-powder whitish to cream (lighter than b 8).

Spores almost globose, $9 \times 8\,\mu$, apparently almost glabrous, but sub immers. minutely punctate (not spinulose).

Fig. spec.: (D. A. suppl. after pl. 902): Falster, Sept. 1934 (F. H. Møller).

The description refers to more mature specimens from Fyn (Trolleborg Nørresø, mixed frondose wood, Sept. 1934).

This species seems to belong to the *R. xerampelina*-stirpe.

R. versicolor J. Schaeff.

Cap 3—8 cm, thin-fleshed, convex then depressed-flat, edge becoming minutely striate and somewhat grooved. Fundamental colour brownish incarnate with a flush of purplish, in the centre yellowish olive or at first darker purple-brown, expallent, becoming olive-yellowish or olive-greenish, edge flesh-coloured or pale. Cuticle detachable. Gills rather crowded, rotundate in front, cream, becoming pale yellow-ochry. Stem rather short, white, discolouring (from base up and in wounds) to a rather vivid yellow. Flesh tasteless; the gills slightly acrid (after mastication). Spore-print light ochry yellow (11—e 5).

Fig. spec.: (D. A. suppl. after pl. 909): Elsehoved (Fyn), gregarious in Betula-bog, Aug. 1936. Also under Betula in Park, "Slukefter", near Odense, Aug. 1937, on drier ground.

R. puellaris is smaller, with whitish spore-powder and saturated amber-yellow flesh in all parts of the mature specimens.

R. curtipes Møller & Jul. Schaeff.

Differing from *R. alutacea* var. *roseola* Lange in having a perfectly white stem (not pinkish at apex) and in the rotundate-free gills.

The spores are of medium size, with short spinules and some few ridges.

Fig. spec.: (D. A. suppl. after pl. 904): Falster, Oct. 1935 (leg. F. H. Møller).

R. flava Rom.

Cap 6—8 cm, convex flat, slightly depressed, of a shining chrome-cadmium yellow, edge slightly striate-grooved. Gills at first whitish, then pale ochry custard-yellow. Stem white with a flush of yellowish (when bruised becoming grayish) almost even, cylindrical. Spore-powder very pale ochre. Flesh mild, discolouring to dirty gray.

Fig. spec.: (D. A. suppl. after pl. 917): A: Örkelljunga, Sverig, Aug. 1928. B: Gerup Skov (Holstenshus), in Betula-bog, Oct. 1929.

Not uncommon but exclusively found under Betula. — The richer yellow colour and the slightly yellowish spore-powder distinguish this species from *R. ochroleuca*. *R. claroflava* Grove is synonymous.

R. fragilis.

Jul. Schaeffer uses this name for the species which I depict sub nom. *R. fallax* and for other adjacent forms.

R. chamæleontina Fr.

Some modern authors refer this species to *R. nauseosa*; but it has no smell.

R. venosa Vel. sensu Melz. = *R. betulina* Melz.

Cap $4^1/_2$—5 cm, slightly depressed, edge slightly striate, cuticle easily detachable, violaceous wine-red or somewhat crimson, dark in the middle. Gills pale custard- or Primula-yellow, rotundate free. Stem rather slender, attenuated upward, venose, white, flushed more or less with pink and becoming tinged dirty brownish from base up. Spore-print pale custard-yellowish. Mild.

Fig. spec.: (D. A. suppl. after pl. 912): A: Husmandsskolen, Odense, in copse (Quercus, Betula etc.), Sept. 1925. B: Sønderso Skov, boggy ground under Betula and other trees, Sept. 1926.

R. venosa var. *pallida* Lange n. var.

Differing from the type by the total want of any red or pinkish colour. The cap is very pale, whitish, with a tinge of livid olivaceous, especially in the middle. The stem is white, with a slight flush of livid from base up, slender and brittle, attenuated upward, hollow, venose.

Spores large, roundish, 8—10 × 7—8 μ (excl. the spinules), spinulose.

Fig. spec.: (D. A. suppl.): Sortsø, Holstenshus, in tufts of Sphagnum in Betula-bog, Aug. 1937, a number of specimens.

If this is not simply an albino, it deserves a specific name. I have not seen anything like it mentioned in literature.

R. atrorubens Quél. (sensu Bres.).

Cap 4—6 cm, convex flat or somewhat depressed, colour blackish red in the middle (o1 + n1, n2, n3), towards the edge lighter purplish red, cuticle easily detachable from the vivid red (m4—m5) surface of the flesh. Edge even (at last somewhat grooved). Gills white, finally somewhat cream-white, almost all entire, rather broad in front. Stem attenuated upward, white, brittle, spongy, apex slightly mealy, about 5 cm × 10—16 mm. Taste very acrid. Spore-powder white.

Fig. spec.: (D. A. suppl. after pl. 894): Elsehoved, on boggy ground under Fraxinus and Salices, among Phragmites, Oct. 1936, gregarious. (Also met with in a bog under Salices etc. in wood, Kirkeby, Sept. 1936.)

R. nigrodisca Peck is probably synonymous. It is closely related

to *R. fallax*, but this latter species is more violaceous, and the flesh under the cuticle is not red.

R. minutula Vel. (?).

Cap 2—$3^1/_2$ cm, convex flat, everywhere minutely punctate-plushy, crimson, darker, somewhat blackish in the centre, edge grooved, cuticle easily detachable. Gills at first white, then very pale custard-yellowish, rather crowded, broader in front. Stem short ($2^1/_2$—$3^1/_2$ cm). Flesh taste-less, brittle. The smell reminds one of *R. solaris*, but is less pronounced. Spore-print custard-yellowish.

Spores oval-spheric, $7^1/_2 \times 6^1/_4\,\mu$ (excl. the spinelets), spinulose-warty (reticulate?). The cuticle has numerous allantoid or sub-clavate, pale pinkish cystidia.

Fig. spec.: (D. A. suppl. after pl. 907): Åløkkeskov, Sept. 1934, in wood of Fagus, gregarious in several different localities.

This species has the stature of *R. fragilis*. A very distinct and easily recognized form.

R. zonatula Ebbesen & Schaeff. (?) (a transition to *R. Melzeri* Zv.).

Cap 4—$5^1/_2$ cm, thin-fleshed, edge almost membranaceous, soon depressed, of a dark brownish flesh-colour (c 4 + n 6) (gooseberry-red) shading off to almost white at the edge which soon becomes striate and grooved. Cuticle thin, detachable. Gills equal, broader towards the edge, whitish, becoming pale creamy ochre (a little deeper yellowish than in *R. solaris*). Stem white, attenuated upward, spongy-hollow, brittle, smooth. Taste slight, after prolonged mastication somewhat pungent. Spore-print pale yellowish ochre (b 7 + b 8).

Fig. spec. (D. A. suppl. after pl. 919): Lundeborg, wood of Fagus (with some isolated Quercus-trees) near the coast.

This species has the stature of *R. solaris*.

R. solaris Ferd. & Winge.

R. albo-citrina Barbier is said to be synonymous and prior to *R. solaris*.

R. mollis Quél.

The form which Jul. Schaeffer describes sub nom. *R. luteoviridans* Mart. var. *urens* Rom. may be identical with my *R. mollis*.

R. maculata Quél.

The plant described in "*Studies*" VI as *R. substyptica* is a quite typical *R. maculata* (very well depicted in "*Iconographia*" tab. 447 by Bresadola).

R. graminicolor var.
The form depicted in "*Studies*" VI sub nom. *R. graminicolor* var. probably is a variety of *R. heterophylla*, to judge from the small spores.

Since the publication (in 1926) of "*Studies*" VI the genus *Russula* has attracted the attention of numerous mycologists in Denmark and abroad; an endless number of new names have been coined, microscopical details have been carefully studied by means of strong lenses, chemical tests have been applied etc. As a result of all this great progress has been attained, but a great number of problems, new and old, are still unsettled. The long list of revisional notes to my monographical paper is a proof of this transitional state of affairs. — The large number of portraits of Danish *Russulas* in my collection (more than 70) will, I trust, be helpful in rendering the study more exact.

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